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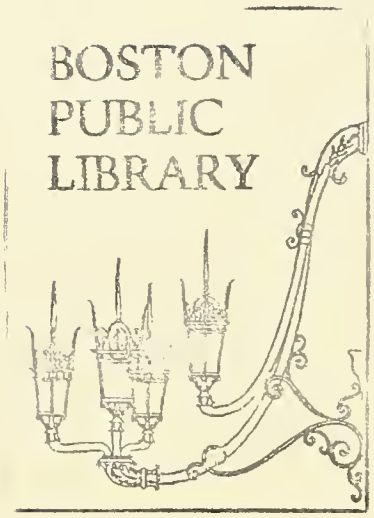
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MASSACHUSETTS GENERAL HOSPITAL

Facilities Replacement
Final Environmental Impact Report

EOEA #5625

HMM ASSOCIATES, INC.
336 BAKER AVENUE
CONCORD, MASSACHUSETTS 01742

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677H
1984

MASSACHUSETTS GENERAL HOSPITAL
FACILITIES REPLACEMENT
FINAL ENVIRONMENTAL
IMPACT REPORT

HMM Document No. 85-1049

April 30, 1986

Prepared for:

MASSACHUSETTS GENERAL HOSPITAL
Fruit Street
Boston, Massachusetts 02114

Prepared by:

HMM ASSOCIATES, INC.
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Concord, Massachusetts 01742

SUMMARY

This Final Environmental Impact Report (FEIR) has been prepared in accordance with regulation 801 CMR 10.32(5)(a)7, 14, and 15 which govern the implementation of the Massachusetts Environmental Policy Act (MEPA). The FEIR consists of responses to comments received on the Draft Environmental Impact Report (DEIR), which was submitted to MEPA's Executive Office of Environmental Affairs on November 15, 1985. It also addresses written comments received on the Massachusetts General Hospital, Facilities Replacement project which were presented to Secretary Hoyte on January 2, 1986.

Section 1.0 of this document is a copy of the MEPA Certificate issued by the Secretary of Environmental Affairs which states the adequacy of the DEIR and issues the comments which will require responses. Section 2 contains copies of the comments submitted by interested agencies and organizations to the MEPA office. Section 3.0 lists all comments by subject matter and by commenting agency/organization with appropriate detailed reponses. Section 4.0 contains Appendices which provide additional information and/or data generated during the preparation of the FEIR.

HMM Associates was responsible for preparing both the DEIR and FEIR. Hoskins, Scott, Taylor and Partners, Inc. architects for the project, provided the consultants with scaled drawings and photographs of exterior views of the Massachusetts General Hospital Facilities Replacement project. Payette Associates, architects for the Research Building, provided the elevations and rendering of the Research Building.

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1. CERTIFICATE OF THE SECRETARY OF ENVIRONMENTAL AFFAIRS ON DEIR

The Commonwealth of Massachusetts
Executive Office of Environmental Affairs
100 Cambridge Street
Boston, Massachusetts 02202

MICHAEL S. DUKAKIS
GOVERNOR

JAMES S. HOYTE
SECRETARY

CERTIFICATE OF THE SECRETARY OF ENVIRONMENTAL AFFAIRS
ON THE
DRAFT ENVIRONMENTAL IMPACT REPORT

PROJECT NAME	:	MGH Facilities Replacement
PROJECT LOCATION	:	Boston, Massachusetts
EOEA NUMBER	:	5625
PROJECT PROPONENT	:	Massachusetts General Hospital
DATE NOTICED IN MONITOR	:	November 26, 1985

The Secretary of Environmental Affairs herein issues a statement that the Draft Environmental Impact Report on the MGH Facilities Replacement project adequately and properly complies with the Massachusetts Environmental Policy Act (G.L., c. 30, ss. 62-62H) and with the regulations implementing MEPA (301 CMR 10.00).

The Draft EIR is generally responsive to my Certificate on the Environmental Notification Form and has provided a sound foundation for review and for the preparation of the Final EIR. The Final EIR should respond in detail to the comments raised in the attached correspondence on the project, revise the analyses of the Draft EIR where appropriate, reconsider the project and the proposed mitigation measures in light of the comments and new analyses, and provide a summary of and commitment to appropriate mitigation measures. When complete, the Final EIR should be circulated to all recipients of the Draft EIR and to the authors of the attached comments.

January 2, 1986
DATE

JAMES S. HOYTE, SECRETARY

Attachments: Thomas (CRWA) Letter - 12/13/85
Bard (MAPC) Letter - 12/23/85
Cook (GPH) Letter - 12/26/85
Sullivan (BWSC) Letter - 12/31/85

JSH/SCD/sd

2. COMMENTS ON DEIR

2.0 COMMENTS ON DEIR

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December 26, 1985

Honorable James S. Hoyte, Secretary
Executive Office of Environmental Affairs
Commonwealth of Massachusetts
100 Cambridge Street, 20th Floor
Boston, MA. 02202

RECEIVED
JAN 1 1986
OFFICE OF THE SECRETARY OF
ENVIRONMENTAL AFFAIRS

Re: Massachusetts General Hospital
Facilities Replacement
EOEA No. 5625

Dear Secretary Hoyte:

This letter is submitted in accordance with the provisions of regulations implementing the Massachusetts Environmental Policy Act ("MEPA"), M.G.L. c. 30 §§62-62H, and promulgated at 301 C.M.R. §10.00 et seq. (the "MEPA regulations") on behalf of Charles River Park "A" Company, Charles River Park "B" Company, Charles River Park "D" Company, Charles River Park "E" Company, Charles River Plaza Company, Prynne Realty Trust, Hawthorne Condominium Trust, and Hawthorne Residents Association (hereinafter collectively referred to as the "Charles River Park and the Hawthorne Place Condominium"). The comments contained in this letter relate to the Draft Environmental Impact Report ("DEIR") submitted on November 15, 1985 by Massachusetts General Hospital (the "Hospital" or "Project Proponent") for certain demolition and construction work in Boston's West End.

As described in the DEIR, the Project Proponent plans to carry out the following activities which are hereinafter identified collectively as the Project. These activities are: (1) demolition of certain buildings on the Hospital campus which have a combined floor space of approximately 450,000 square feet and include three patient-care buildings (the Phillips House, the Vincent-Burnham Building and the Baker Building) of 9, 11, and 13 stories in height and three other buildings (the Clinics Building, the Rehabilitation Building and the Temporary Building) of 1 to 3 stories in height; (2) construction of four new buildings with a combined floor space of approximately 900,000 square feet, three of the buildings being patient-care facilities of 6, 16, and 26 stories in height and the other building being a 12 story research facility (the "Research Building"); and (3) building and reconfiguration of roads, as well as of landscaping activities

and various site improvements relating to the above-described demolition and construction work.

An Environmental Notification Form ("ENF") for the Project was submitted to your office on June 27, 1985, and a scoping session for the Project's DEIR was held on Thursday, July 18, 1985 pursuant to §10.05 of the MEPA regulations. Charles River Park and the Hawthorne Place Condominium submitted comments to the ENF on July 30, 1985. Those comments urged that both the patient-care and research facilities be considered in a single EIR. The comments also urged that you scope the EIR to cover a full range of potential environmental impacts from the Project, including the impact on traffic, wind, shadows, views, historic resources, and open space.

The EIR scoping decision was issued on August 9, 1985 (the "Scoping Decision"). It stated that the Project was categorically included under §10.32(5)(a)7, 14, and 15 of the MEPA regulations and therefore required preparation of an EIR. The scope set forth in that decision called for consideration of alternatives to the Project, as well as of wind impacts, shadow impacts, the effect on views from adjacent buildings, aesthetic effects on the Charles River waterfront, open space impacts, pedestrian circulation impacts, and historic resource impacts. The long-term effects of the Project were also scoped, including effects on traffic, parking, and sewage generation, as were possible measures to mitigate these effects and a full analysis of regulatory requirements to which the Project would be subject. In addition, the Project Proponent was specifically directed to include the potential impacts from construction of both the new patient-care facilities and the Research Building.

We have reviewed the DEIR and find that it contains serious inadequacies in both its description and analysis of the Project. As discussed more fully below, the description of both the Project and its alternatives is incomplete. Furthermore, the DEIR contains insufficient or inappropriate data on certain key impacts, and it does not provide the necessary analysis of both these and other impacts.

With respect to the Project description, it should first be noted that the DEIR is incomplete, particularly with respect to its description of the Research Building. Moreover, the DEIR fails to mention the hotel which is to be included in one of the patient care facilities according to materials submitted by the Project Proponent in its August, 1985 application to the

Massachusetts Department of Public Health ("DPH") for a Determination of Need ("DON"). In addition, the DEIR does not fully discuss all of the state permits and approvals that may be applicable to the Project, including the permits and approvals required for construction on filled tidelands and for the emission of air pollutants.

With respect to the analysis of Project impacts, the DEIR fails to provide sufficient data on traffic impacts, and it does not employ the most accurate wind data. Moreover, it fails to provide the proper analysis of these impacts and other impacts included in its scope. Indeed, the DEIR does not adequately consider alternatives to the Project which would mitigate its adverse impacts, and it provides no serious consideration of the impacts associated with the Research Building.

For the reasons articulated above and discussed more fully below, we believe that the Project Proponent should be required to revise its DEIR before it is reviewed by your office for approval. To assist you in your consideration of our comments, we have enclosed a table of contents as Attachment A. Enclosed as Attachment B is a review of the DEIR's traffic impact analysis which was prepared by Robert D. Vanasse of Vanasse/Hangen & Associates, Consulting Engineers and Planners.

I. INADEQUATE PROJECT DESCRIPTION

A. Inadequate Discussion of Research Building

The DEIR does not include information that is essential for a complete and thoughtful consideration of Project impacts. One major area of concern is that the DEIR contains hardly any description and no depiction of the Research Building, nor any discussion of its uses, despite the fact that the Scoping Decision clearly states that the Research Building must be considered as part of the Project. The DEIR states that there will be eighty new employees as a result of constructing the Research Building, with no explanation given as to why a new 12-story structure is necessary for such a small number of additional employees.

Given the size of the new research space to be constructed, it would appear very likely that a larger number of employees will actually work at that facility when it is constructed or sometime thereafter. As described more fully below, the resulting impact on traffic, parking, and density in the Project area is of particular concern to Charles River Park and the Hawthorne Place Condominium which are located directly adjacent to this proposed building. Thus, a fuller and more candid discussion of the Research Building is necessary in the DEIR.

B. Failure to Discuss Hotel Use

A second area of concern is the inclusion of hotel space in the proposed 26-story patient-care building. In its Application for a DON, the Project Proponent states that the new patient-care facilities will contain a hotel. This is never discussed or even mentioned in the DEIR, and the Application for a DON contains little discussion of the size, capacity, and usage of that hotel.

Despite the lack of information about the hotel that has been made available by the Project Proponent, it is difficult to imagine that there will be no impact on the already congested traffic and parking conditions in the vicinity. Depending upon its use, the generation of traffic trips for a hotel could be significantly different from those of a hospital or a work place and thus should be considered in the traffic analysis contained in the DEIR. Such incompleteness in the DEIR results in a lack of confidence that all the significant environmental impacts of this Project have been identified and considered.

C. Inadequate Discussion of Patient-Care Building Usage

The DEIR contains an inadequate description of the uses for the patient-care buildings. It states that some of the space in these buildings will be devoted to hospital beds. However, it does not state the number of hospital beds to be located in the new buildings, and it does not describe the nature of the medical or surgical services that will be provided in the new facilities. Indeed, even the DON Application contains no

information about the uses for several of the uppermost floors in the new buildings, namely, the twenty-second through the twenty-sixth floors in the 26-story building and the fifteenth and sixteenth floors in the 16-story building. Moreover, there is no indication of the uses for the 6-story building.

D. Failure to Discuss Energy Source for Heating and Cooling

The DEIR fails to identify the energy source(s) for heating and cooling the proposed new buildings. As discussed below, the use of fossil fuel burning equipment for such purposes could result in air quality impacts. Moreover, additional state permits and approvals could be needed. The DEIR should be amended to identify the energy source(s) and discuss these other issues if they are relevant.

II. PROJECT ALTERNATIVES

Section 10.05(7)(e) of the MEPA regulations states that, in preparing an EIR:

> Alternatives to the proposed project must be listed, and the major benefits and costs of each described. The alternatives shall be evaluated giving primary consideration to the proponent's and any participating agency's mission or pertinent legislative mandate, including the mandate of M.G.L. c. 30, §61 that agencies use all practicable means and measures to minimize damage to the environment, and the protection of the public interest. Alternatives not discussed because of their presumed inferiority must be noted.

The DEIR discussion of alternatives to the Project fails to meet those regulatory requirements in a number of respects. First, the DEIR fails to give full and serious consideration to alternatives encompassing the construction of smaller scale buildings. The DEIR reveals that the increased height of Project structures is largely responsible for many of the most important adverse environmental impacts of the Project, such as the increase in density, shadow and wind effects, and the obstruction of views in the vicinity of the Project. Therefore, serious consideration should be given to alternatives which call for smaller buildings.

Despite this obvious need for serious consideration of smaller scale buildings, the DEIR provides only a grudging and disingenuous discussion of these alternatives. The principal objection stated in the DEIR to the smaller scale alternatives, i.e. Alternatives B-1, B-2(A), and B-2(B), is that all these alternatives would result in the elimination of some number of existing hospital beds. See DEIR at pages 5-2 to 5-3. However, the Project Proponent has stated that the number of hospital beds would be reduced from 1,082 to 977 in its Application for a DON submitted before the DEIR.

For reasons not articulated in the DEIR, such a reduction in hospital beds is rejected in its consideration of Alternatives B-1, B-2(A) and B-2(B) to the Project. Because of this important and unexplained discrepancy between the DON Application and the DEIR, it is impossible to thoughtfully evaluate the real costs of several project alternatives identified in the DEIR. Consequently, the DEIR must be amended to identify the number of hospital beds for the patient-care buildings, and to consider alternatives for mitigating the adverse impacts associated with construction of buildings to house these beds.

In addition to its failure to fully and seriously consider smaller scale buildings, the DEIR provides only a brief and conclusory consideration of alternatives that would involve off-campus construction of the new facilities. Indeed, this discussion is limited to construction of such facilities across Blossom Street at Charles River Park, see Alternatives A-1, A-2, and A-3, even though the Hospital owns or controls several parcels of land in the general vicinity of the Project site, including land now used as a parking lot near North Station and a parcel of land at the corner of Cambridge and Blossom Streets.

Furthermore, Alternatives A-1, A-2, and A-3 do not represent viable alternatives to the Project since negotiations with Charles River Park to obtain the property needed for these alternatives ended in late 1983, long before publication of the DEIR. Thus, there is no real prospect that the Charles River Park property can be obtained. Without Alternatives A-1, A-2, and A-3, the DEIR does not provide a discussion of the costs and disadvantages of utilizing other property to fulfill

Project needs, thereby effectively reducing the negative impacts associated with massing of new buildings on the Hospital campus.

III. INADEQUATE REVIEW OF STATE PERMITS AND APPROVALS

A. Failure to Discuss Chapter 91 License

The Scoping Decision requires that an examination be made of each permit and approval requirement applicable to the Project and that, for each applicable permit or approval, "a comparison should be made of the project to the governing standards or criteria and the status of applications and reviews should be described." Nonetheless, the DEIR fails to properly address the issue of the Project's need for a coastal tidelands license pursuant to M.G.L. c. 91 (the "Chapter 91 license").

Chapter 91 provides in pertinent part that:

> Any changes in use or substantial structural alteration of a licensed structure or fill, whether said structure or fill first was licensed prior to or after the effective date of this section, shall require the issuance by the department of a new license in accordance with the provisions and procedures established in this chapter.

In order to determine whether the requirement for a Chapter 91 license is applicable to the Project, it is necessary to ascertain whether the Project will be built on filled tidelands. While the DEIR contains no such discussion, maps showing filled tidelands were provided in the Final EIR submitted by the Project Proponent for the Ambulatory Care Center, which EIR was dated June 30, 1975 and was designated as EOEA No. 01273. From those maps it can be seen that at least the demolition of existing buildings and construction of the Project's new patient-care buildings will take place on filled tidelands. While we do not know if those maps delineate all the filled tidelands at the construction site, we note that it is the Project Proponent's responsibility to provide such information as part of its consideration of the regulatory permits and approvals applicable to the Project.

Furthermore, the DEIR appears to employ an incorrect legal standard in concluding that no Chapter 91 license is required for the Project. It simply states that the Project represents "a physical expansion of space, but no change in use from existing uses. No construction is planned for areas not currently built upon." DEIR at pages 3-8. However, Chapter 91 clearly requires a license whenever there is a "change in use or substantial structural alteration" on filled tidelands. Surely the demolition of existing buildings and their replacement by at least three new buildings, with a very significant increase in floor area, on filled tidelands is a substantial structural alteration. Furthermore, even the standard employed in the DEIR should result in a license requirement if a hotel is created on a site where there is no such usage now.

It should be noted that the application of Chapter 91 to this Project is particularly important here where the Project consists of non-water dependent uses. Accordingly, the Department of Environmental Quality Engineering ("DEQE") must conduct a public hearing and consider the question of whether the Project as currently planned "shall serve a proper public purpose and that said purpose shall provide a greater public benefit than public detriment to the rights of the public in said [filled] lands and that the determination is consistent with the policies of the Massachusetts coastal zone management program." M.G.L. c. 91, §18. The DEIR should therefore be revised to include a comparison of the Project to the governing statutory standards or criteria.

B. Lack of Information on Air Pollutant Emission Permits

As noted earlier, the DEIR fails to identify the energy source for heating and cooling the Project buildings. If fossil fuel burning equipment will be used in place of, or as a supplement to, the underground steam lines now used by the Hospital, then state air pollutant emission permits may be needed. The DEIR should therefore be amended to identify the energy source(s) for heating and cooling and it should also discuss any state permits and approvals needed in connection with use of the energy source(s).

IV. INADEQUATE DISCUSSION OF IMPORTANT ENVIRONMENTAL IMPACTS

A. Introduction

The DEIR contains an inadequate or incomplete discussion of a number of the most important environmental impacts of the Project. For many types of impacts, the construction and design of the Research Building is completely ignored, despite the explicit direction in the Scoping Decision. In other instances, the DEIR contains only a cursory or conclusory discussion of the Project's impacts. As a result, the DEIR does not provide the public or the EOEA with adequate information or analysis of the Project's impacts. The following specific deficiencies are noted in particular:

B. Consideration of Impacts from the Research Building

The Scoping Decision clearly states that the Research Building must be considered as part of the Project in the DEIR. Nonetheless, there is no discussion of the Research Building in the section relating to the Project's construction impacts even though the Scoping Decision noted that "the major areas of potential impact for the MGH New Facilities and Research Building will be those associated with construction activities. These will be the major topics of the EIR, which will also include project design effects and the long-term effects of the project." (emphasis supplied). Furthermore, there is hardly any discussion of the Research Building's impacts in the discussion of Project views, traffic, and aesthetics, and no other discussion of its impacts. The DEIR provides no discussion of the research activities that are anticipated to take place in the Research Building. This failure to address an important component is consistent with the DEIR's overall lack of details about the Research Building.

In revising the DEIR, the Project Proponent should discuss the nature of operations intended for the research facility, including the effects associated with the use of hazardous, toxic, or radioactive materials. The revised EIR should also indicate whether any recombinant DNA or biological research

will be performed in the Research Building and what safeguards, if any, are planned for the facilities and operations. Finally, the DEIR should consider the impacts of and special precautions associated with construction of the Research Building over the Hospital's gas cylinder storage area which apparently includes both explosive and toxic gases.

C. Consideration of Traffic Impacts

Because of inadequacies in the DEIR's treatment of the Project's traffic impacts, it is not possible to make any independent evaluation of the DEIR's conclusions. As explained in the letter from Robert D. Vanasse, P.E., copy enclosed as Attachment B, the data base relied upon by the DEIR in its discussion of traffic is incomplete in a number of important respects. These inadequacies include the failure to discuss the traffic impact of the hotel planned for the 26-story building; omission of critical portions of the neighborhood, such as Leverett Circle, from the traffic study area; and omissions and inadequacies in the normal transportation engineering and analysis procedures. Consequently, the DEIR's consideration of traffic impacts is inadequate and must be revised.

D. Consideration of Wind Impacts

The DEIR wind analysis is based on data collected at Logan Airport from 1965 to 1975. However, it is our understanding that the use of such data provides a far less accurate measure of wind impacts at the Project Site than other data which is readily available from Logan Airport for the time period from 1945 to 1965.

This earlier data is better for two important reasons. First, at that time there were no tall buildings at Logan Airport, and thus the data collected provides a true picture of "background" winds. Data collected between 1965 and 1975 reflects the wind impacts from the tall buildings which had been built at the airport. Thus, the data is not representative of "background" winds.

A second reason why the earlier data permits a more accurate wind analysis is due to the more frequent monitoring of wind velocity from 1945 to 1965 and to the fact that the time period monitored is twice as long. With respect to the monitoring frequency, wind velocity was measured every hour at Logan Airport from 1945 to 1965. After that time period the measurement frequency was reduced to only once every three hours. Because of this reduction in monitoring frequency and in the length of the sampling period, only about one-sixth of the data available from 1945 to 1965 is available for the time period for 1965 to 1975. Moreover, this very major reduction in the amount of available data must be considered in light of the need to separate the data by season, as well as by wind direction. Consequently, the number of data points for a particular wind direction in any given season may well be too few to permit any kind of meaningful analysis, a situation that could be easily corrected by use of the wind data for the time period for 1945 to 1965.

Since more accurate wind data is readily available, such data should be employed to permit the best estimate of wind impacts in the DEIR. Such an analysis is particularly significant with respect to the proposed 26-story patient-care building which will apparently be faced with glass, a material that has been known to create a safety hazard in other parts of Boston. Moreover, as noted below, the wind impact is of particular concern in areas that fall within the shadows cast by proposed or existing buildings. Thus, a most accurate wind impact analysis should be prepared in order to understand the true effect of shadow impacts and to consider the most appropriate mitigating measures for both wind and shadow impacts.

E. Consideration of Impacts Associated with Increased Sewage Generation

The DEIR estimates that additional sewage flows of approximately 200,000 to 261,000 gallons per day may be generated upon completion of the Project, an increase of between 20 and 25 percent. The rationale for this estimate is difficult to understand since it appears to be based on the Project's increased floor area, but then part of the resultant increase is discounted because of the estimated number of

people that will supposedly be housed in each building. As the Secretary is well aware, use of an accurate estimate is very important in light of the fact that the City of Boston water and sewer system is already overburdened.

As discussed above, in Part I of these Comments, there are serious deficiencies in the information provided by the Project Proponent about the ultimate use of the new floor space which will be created by the Project and which will result in a doubling of affected floor areas. Thus, the estimates of sewage generation cannot be accepted on face value. For instance, there is no discussion of the impact of a hotel located in the new inpatient facilities complex. Moreover, there is no information at all on the proposed uses for a number of floors of the three new inpatient facilities buildings. Thus, it is impossible to estimate what the ultimate impact will be on sewage generation stemming from these floors. In this regard, it is interesting to note that the estimate of increased sewage flow provided in the DEIR, i.e. 200,000 to 261,000 gpd., is significantly higher than the estimate of 150,000 to 180,000 gpd. provided in the ENF. No explanation for this increased estimate is provided.

In summary, it is extremely difficult to believe that a doubling in floor space as a result of the Project will not in turn result in a significant increase in use and an accompanying significant increase in sewage discharges. Again, it appears that a Project impact has not been candidly and thoroughly addressed in this DEIR. Moreover, the DEIR provides no discussion of the capacity of the municipal system servicing the Hospital to accommodate the increased sewage flow which the DEIR does concede will result. In revising the DEIR, the Project Proponent should be required to address this impact and consider such issues as the necessity for holding tanks, the feasibility of separating storm water discharge from sanitary sewage and the feasibility of directing uncontaminated storm water discharge directly to the Charles River. Such a discussion would of course be improved by a more precise and supportable estimate of projected discharges, as well as an accurate accounting of the existing flow.

F. Consideration of Construction Impacts

The DEIR discussion of the Project's construction impacts is also incomplete. The description of the staging of construction set forth on pages 6-152 to 6-154 does not include a discussion of the timing or the procedure for constructing the Research Building, despite the fact that the Scoping Decision specifically calls for a discussion of construction impacts from the Research Building. It should be noted that there will be particular construction problems associated with the fact that the Research Building will be located over the Hospital's gas cylinder storage area which apparently stores both toxic and explosive gases. Furthermore, this section of the DEIR does not specifically address construction of the new driveway on to Charles Street which is a part of the Project. The DEIR should be revised to explicitly consider these important aspects of construction.

Furthermore, consideration of the noise impacts of the eight-year construction project on neighbors of the Hospital is inadequate. For instance, the DEIR states that construction impacts will be mitigated by operation of construction equipment only during hours when, it claims, many of the neighboring residents will not be at home. In fact, the times provided in the DEIR at page 6-165 extend from 7 a.m. until 4:30 p.m.. This includes early morning hours when it is likely that significant numbers of neighboring residents will be at home and are likely to be disturbed by noise.

The DEIR also fails to provide for careful consideration of the impact of construction on filled land. For example, there is no consideration of such questions as impacts on the water table and groundwater in the Project area. This analysis is of particular importance given Boston's history of displacement of buildings by groundwater and the problems already besetting the residents of Brimmer Street and the lower part of Beacon Hill due to prior construction on filled land.

G. Consideration of the Effects on Views

The section of the DEIR which discusses the impact of the Project on views of surrounding areas is incomplete in several respects. First, little serious attention is given to the impact of the proposed 12-story Research Building on such views other than the conclusory statement that this building will have a corner cut off to minimize any obstruction of views "as much as possible." While it is conceded that such views will be impeded, the only photograph used in the DEIR to illustrate impact on views, Figure 6.5.4. at page 6-115, shows the impact on the views from an apartment at Longfellow Place, the segment of Charles River Park and the Hawthorne Place Condominium furthest from the Research Building. Moreover, there is no rendering of the design of the Research Building so that the reader can make an independent evaluation of whether and to what extent the obstruction of views will be minimized. Such an inadequate consideration of an important visual and aesthetic impact of the Project is consistent with the entire tone of the DEIR which does not acknowledge the important impacts of the Research Building or seriously address those impacts as part of the planning for this Project.

Similarly, the DEIR dismisses without serious discussion the impact of the Project on lower-level apartments in Charles River Park and the Hawthorne Place Condominium, other than to state in a conclusory manner that views from lower-level apartments in Longfellow Place are already limited. Furthermore, no photographs or figures are provided to illustrate this statement so that the reader cannot independently evaluate this claim. Accordingly, no consideration is given of the full impact of the Project on its neighbors' views.

In connection with its inadequate discussion of the impairment of views, the DEIR dismisses any acknowledged impairment, by concluding that only views of Cambridge and to the west are obstructed. The DEIR states, without reference to any authority, that these are "less significant" or secondary views. The DEIR again provides insufficient discussion to support these conclusions.

H. Consideration of Aesthetic Impacts

The DEIR contains an inadequate discussion of the aesthetic impact of the Project on the surrounding area. First, even a brief review of this section reveals that it is primarily focused on the Hospital campus itself. Little attention is given to the Project's aesthetic impacts on the surrounding area. In particular, there is no discussion of its impact on the visual character of that area, which has been singled out by the Boston Chamber of Commerce and the Boston Society of Architects as a "Conservation Area" where the existing scale of buildings should be preserved and maintained. There is no discussion of the Project's lack of compatibility with the proposed new height limit policy of the Boston Redevelopment Authority ("BRA") for the City of Boston.

Moreover, there is practically no discussion of the design of the proposed Research Building except for the statement that it is to be of masonry construction and that it will have its southeast corner cut off on the upper levels. The photographs of the scale models of the Project do not include or do not identify the Research Building and there is no rendering in the DEIR of the Research Building. Thus, it is necessary to take at face value and without the benefit of any illustrative reasoning or description the flat statement in the DEIR that this proposed, 12-story building "will serve as an extension of existing structures."

Thoughtful consideration by the public of the Project's aesthetic impact is made difficult by the sketchy information given about the other aspects of the Project design as well. The map in the DEIR, which provides information about the massing and layout of the Project, Figure 3.1.1 on page 3-2, is confusing and unclear as to the exact placement of the three buildings in the inpatient facilities complex. Thus, it is impossible to assess such important questions as the visual impact of the 26-story building on the pedestrian area along the banks of the Charles River to the west of the Hospital complex.

Moreover, no serious attention is given to the important question of the "canyonization" impact of the new 26-story structure along Storrow Drive, an impact exacerbated by the neighboring Charles Street Jail and Massachusetts Eye and Ear Infirmary ("MEEI") buildings massed along the same highway. Given the lack of adequate design information, it is difficult to assess the DEIR claims that the proposed setback of the new 26 story building will mitigate the impact of its height and monolithic appearance on the areas to the west of the Hospital. Indeed, the new 26-story building is taller than the adjacent MEEI which already faces Storrow Drive.

The DEIR simply states in conclusory fashion that "canyonization" will be reduced by demolition of the existing Phillips House. DEIR at page 6-112. It does not provide a thoughtful discussion of how the proposed setback of the building will mitigate the inevitable visual effects caused by its height and design, particularly with respect to its impact on the Charles River Playground and riverfront parkland. Thus, it remains unclear whether the razing of the eight-story, brick Phillips Building and its replacement by the 26-story, dark-green glass inpatient facilities building will in fact reduce canyonization.

I. Consideration of Air Quality Impacts

The DEIR states that one of the buildings to be demolished is known to contain asbestos. Other buildings could of course be found to contain asbestos as the demolition work proceeds. While the Hospital patients constitute a population group which would appear to be at particular risk from asbestos emissions, the DEIR fails to articulate the specific procedures or equipment to be employed in order to protect such patients and the neighborhood in general from asbestos emissions. For example, the DEIR, page 6-168, merely states that an area containing asbestos material "will be sealed off", and that the asbestos will be wetted down. More detailed consideration should be given to such questions as to how asbestos-containing areas will be sealed off and where such material will be stored at the site prior to transport and disposal.

Another air quality issue relates to air pollutant emissions generated during construction as well as after the Project has been completed. The DEIR states on page 6-157 that air quality impacts during construction "are anticipated to be limited to emissions of fugitive dust." No statement at all can be found in the DEIR with regard to air quality impacts after completion of the Project. Because of the deficiencies noted earlier in the traffic impact analysis, as well as the expectation that there will eventually be a significant increase in the Hospital population and traffic due to the proposed doubling in floor area, it is difficult to believe that there will not be an appreciable impact on air quality. Such an impact should be considered, along with measures to mitigate that impact.

Another air quality impact that could result from the Project relates to its use of fossil fuel burning equipment for heating and cooling. As noted earlier, the DEIR never explains how the proposed new buildings will be heated and cooled. If the underground steam system is not employed or serves only part of the Hospital's needs, then the impact of any fossil fuel burning equipment should be seriously considered.

J. Consideration of Shadow Impacts

The discussion of the shadow impacts of the Project is insufficient in that the shadow analysis is not coordinated with a discussion of the wind impacts created by the new buildings. This is of particular importance since the severity of the shadow impacts is exacerbated where they occur in a windy area. Since the DEIR acknowledges that there will be shadowing on the Charles River playground and riverfront parkland as a result of the Project, the DEIR should contain a fuller discussion of the extent of the shadowing and its impact on parkland use. Moreover, greater consideration should be given to the aesthetic concerns associated with shadow impacts.

K. Consideration of Open Space Impacts

The DEIR does not clearly describe open spaces that will be eliminated by construction of the new buildings, nor does it provide a thoughtful discussion of the impact of the Project on

surrounding open space areas. Instead, the DEIR contents itself with the conclusion that there will be no impacts on those areas from the new buildings, since the new buildings are not immediately adjacent to the existing areas of open space. Furthermore, there is no discussion of the impacts on other open spaces such as the Charles River playground and riverfront parkland, nor of the fact that the floor-area ratio of the Hospital's campus will significantly increase as a result of the Project.

The amendment to the Planned Development Area ("PDA") # 15, approved by the BRA on June 28, 1984, indicates that the floor-area ratio will increase from 4.26 to 5.13 as a result of the Project, representing a considerable increase in the density and intensity of use at the Hospital. Moreover, this constitutes an increase over the floor-area ratio which had earlier been increased over the zoning allowance, upon BRA and Zoning Commission approval, in order to accommodate construction of the Wellman Research Building at the Hospital. Such increases in density, as well as the impact on existing open space both on and off-campus, should be addressed in the EIR.

L. Consideration of Impacts on Historic Resources

Consideration of the Project's impact on historic sites in the area is too limited and again is almost totally focused toward on-campus impacts, with no real consideration being given to the effects of the Project on Hospital neighbors. In the discussion of the impact of the Project on views of the Ether Dome and of the Bullfinch Building in general, the DEIR merely considers the views of these historic sites from a single vantage point just outside the entrance to the Hospital campus. No consideration is given to the impact of the new buildings on views of the historic sites from the neighboring Charles River Park and Hawthorne Place buildings or other areas off-campus.

It is not sufficient for the Project Proponent to simply claim, as it does in the DEIR at page 6-138, that no evaluation or even identification of impairment to historic sites is necessary because the single vantage point which it considers as the "best" spot for viewing the Bullfinch Building is not obstructed. M.G.L. c. 9, §26B defines the "effect" on an historic resource, which should be considered by the Secretary

in consultation with the Massachusetts Historic Commission, as "any change in the integrity of the location, design, setting, material, workmanship, feeling or association of the site." The DEIR fails to address the full range of possible effects of the Project on historic resources.

M. Consideration of Cumulative Impacts in Conjunction with Other Projects

The DEIR fails to discuss the cumulative impact of the project in conjunction with other proposed projects in close physical proximity to the Hospital, such as the Charles Street Jail project and the new 3,000 person GSA Building. In particular, the work anticipated to be done to the Charles Street Jail will have significant construction and long-term impacts, including traffic impacts, which should be assessed in conjunction with the Project.

V. CONCLUSION

The DEIR is deficient and inadequate in a number of respects. First of all, it contains an incomplete description of the Project and fails to provide essential information about the actual design and projected uses of the buildings to be constructed. Furthermore, it also fails to seriously consider alternatives to the Project, in particular the alternatives that involve smaller-scale construction and decentralization of the Hospital plant. It fails to adequately consider all permits or approvals needed for the Project and provides little information about the research facility that is being built as part of the Project. Finally, its evaluation of a number of environmental impacts is inadequate and fails to address the impacts on neighbors of the Hospital, but instead focusses simply on the impacts to the Hospital itself.

Accordingly, we believe that the Project Proponent should be required to revise the DEIR to address the issues raised in our comments before it is considered for approval under MEPA.

Respectfully submitted,

Susan M. Cooke for

Susan M. Cooke
Edward J. DeAngelo

ATTACHMENT A

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VH
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[illegible] Massachusetts 02[illegible]
617 783-7000

[illegible] Engineers
& Planners

ATTACHMENT B

December 26, 1985

Susan Cooke, Esquire
Goodwin, Proctor and Hoar
Exchange Place
State Street
Boston, MA 02109

Re: Massachusetts General Hospital
Draft Environmental Impact Report
EOEA No. 5625/Transportation Review

Dear Ms. Cooke:

At the request of Goodwin, Proctor and Hoar, Vanasse/Hangen & Associates has, on a very preliminary basis, conceptually reviewed the Draft Environmental Impact Report dated November 15, 1985, and submitted by HMM to MEPA for the above referenced project. Due to the extreme time constraints, our review has been limited to a qualitative framework and actual quantitative analysis has not been accomplished. As a guide in preparing this preliminary narrative, we have utilized portions of the original Environmental Impact Report prepared for the Ambulatory Care Center at MGH in 1975.

We have divided our analysis into several key areas, upon which we have made general qualitative comments:

- STUDY AREA

  It is felt the study area contained in the Draft EIR should have also included adjacent areas of Storrow Drive, both eastbound and westbound, areas along Cambridge Street east of Blossom Street and the critical approaches to Leverett Circle via Storrow Drive and Charles Street. Understanding that there are critical existing traffic circulation and congestion problems at these locations, a quantitative review of each of these areas should have been included, even though jurisdiction mitigating measures might not eventually fall with the Hospital.

- TRAFFIC COUNTS

  Considering the extremely critical and sensitive location of the existing campus, it is felt that the traffic count data should have been far more extensive than what is indicated in the appendix of the Draft EIR. Mechanical counts and turning movement counts collected over short duration periods appear to

have been input directly into the level of service calculations without any modification or correction factors at many of the locations. It would seem prudent on arterials of such critical importance to take a longer look at the traffic data, correct for seasonal and daily variations as appropriate, and then input into the analysis calculations. A base network, balanced and analyzed should be the basis of any future projections to Horizon Years

- TRAFFIC AREA GROWTH

  Without a detailed distribution matrix it is virtually impossible to verify the underlying premise of future Horizon Year assignment and distribution networks. Although an effort was made to account for key area projects, it is not clear whether those projects listed are all the critical projects which would impact the study area. Further detail and expansion would appear appropriate.

- TRIP GENERATION

  The Draft EIR represents that approximately 450,000 square feet of existing facilities will be replaced over an 8-year period by approximately 900,000 square feet of new construction. Additionally, a twelve story research building is projected to be added to the campus. It is extremely difficult to accept that the net result of this expansion would be approximately 80 additonal employees in the Research Center.

  If this is indeed the case, a detailed breakdown of the future population by staff and user category, similar to that in the original 1975 ACC should at least be included so that a comprehensive analysis can be performed. Absolutely no support data is supplied to corroborate this conclusion. Since this aspect of the study is perhaps the most important in assessing the project's transportation impacts, significant additional information as described above should clearly be supplied.

  A continuing thread of analysis logic which runs through the technical sections of the DEIR bases much of the utilized data on other studies conducted for either this facility or other adjacent Boston CBD projects. While this is appropriate for part of the analysis, it would seem proper and, in fact, essential that detailed census surveys be updated and conducted again as necessary to corroborate, modify and/or correct the 1975 data supplied in the original ACC/EIR.

Based upon accepted standards of the transportation and traffic industry regarding trip generation of new and replacement facilities, it is remarkable that this amount of additional floor space would not produce new person and or vehicle trips to the campus. If this is indeed the case, substantial back-up should be supplied to verify this fact.

- MODE SPLIT

The proposed modes split of person trips has been generated from prior studies of this campus and adjacent studies performed by the Consultant as well as other Boston CBD studies and EIR's. Considering the magnitude of the proposed change, it would again be appropriate if some MGH surveys had been conducted of actual 1985 campus usage to corroborate these values.

The trip generation characteristics and consequent mode split percentages are of such importance that each of these areas should have been researched thoroughly and updated to 1985 conditions.

- FUTURE HORIZON YEAR NETWORKS 1995

Again, without access to the detail assignment and distribution matrix and its underlying assumptions, it is impossible to assess the future 1995 build networks. A cursory review of 1985 and 1995 networks reveals link volume changes which at first review appear to be somewhat on the low side, i.e. the site specific and background growth for selected links in the analysis network appear extremely low. Again, if this is indeed the case, the detail backup information should be supplied.

- LEVELS OF SERVICE ANALYSIS

The tabulation presented in the Draft EIR for future Build and No Build conditions indicate numerous areas of Level of Service E and F. This is evident particularly at Charles Circle and Cambridge Street, Charles Circle and Longfellow Bridge and Cambridge Street at North Grove Street. In all probability it would also reflect conditions at Leverett Circle and certain areas along Cambridge Street not included in this study. Based upon existing driving conditions during the peak hours, which consistently exhibit low levels of service, significant congestion and long delays throughout this area, the results would seem appropriate for the future years as well as todays existing conditions.

The measures to mitigate harm discussed in the Draft EIR appear to make cosmetic improvements and do not attack the underlying reasons creating the corridor and intersection problems. As is required and traditional with Environmental Impact Reports prepared for MEPA, the full measures to mitigate harm required to remedy this situation should be presented in the report. It is clearly understood that the responsibility to implement these improvements in many instances would not be the Hospital's and would fall to the public sector, but the required measures should at least be defined and explained in this study.

Consequently, improvements required at Charles Circle, Leverett Circle and/or at each of the individual intersection locations, in many cases, are not clearly defined in this report. Utilizing the reasoning that those conditions which exist now would exist in 1995 independent of additional campus construction may indeed be true but does not eliminate the requirements to define those improvements.

- PUBLIC TRANSIT

  Again, measures to mitigate harm are treated with narrative regarding the Red, Orange and Green Line improvements slated for the adjacent transit lines within the study area. No attempt at a measure of impact of these improvements has been made in the EIR. Again, it is our understanding that at least an attempt to quantify the impacts of these improvements should be listed and categorized in this report.

- TRAFFIC/CONSTRUCTION PHASING

  Again, throughout the Traffic/Construction Phasing section, no substantive analysis has been included. The narrative describes conditions that are expected and measures that will be employed but absolutely no detailed analysis is supplied, particularly in the critical intersections.

- PARKING

  The 1975 ACC effort contained results of a fairly extensive parking survey conducted at all on-campus facilities and selected satellite locations controlled by the Hospital. Detail measurements involving inventory, percent occupancy, duration of stay by user category, turnover rates, etc., were established for each of the facilities. Again, it would seem appropriate that at least an update of these extensive studies conducted in 1975 should have been undertaken for this effort.

Furthermore, no exploration of providing increased supply is explored in the EIR. The employment of Management Strategies and Demand Modification Techniques is admirable and indeed appropriate, but a more extensive discussion of this element, including all the detailed analysis and support data, should have been included in the report. It is extremely difficult to draw substantive conclusions from the data currently included.

Again, measures to mitigate harm might be outside of the control of the project proponent but it is a requirement to delineate all potential required improvements.

- SITE CIRCULATION CAMPUS PENETRATION

  It does not appear that a derivative analysis of the Build conditions with the new access and circulation plan in place has been conducted for the existing street intersections. Although analysis for the new intersection is contained in tabular format, the impact of the new circulation and access patterns on the approximately 6 adjacent site intersections does not seem to be included.

In summary, we feel much additional information need be supplied so that an effective analysis check may be performed on the Draft EIR report. Furthermore, the underlying assumptions that no new staff and/or consequent vehicle trips would be produced by a doubling of the square footage to 900,000 square feet should be extensively documented. If this is indeed the case, substantive backup information should be provided so this assumption may be verified. This element of the analysis is extremely critical to the transportation elements of Draft EIR process and should be significantly detailed to provide a level of comfort to the reviewing agencies.

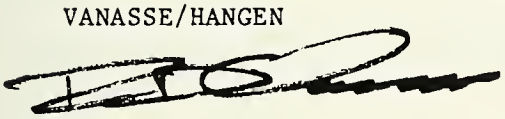
Finally, the level of detail, in describing the measures to mitigate harm should be expanded. It is clearly understood that this process may delineate required offsite improvements well beyond the responsibility of the project proponent. Nevertheless, it has been traditional and accepted practice in the preparation of an EIR to detail these requirements. The final decision on requirements, as specified in the regulations, is one to be made by MEPA once all the alternatives have been included for analysis in the Environmental Impact Report.

Consequently, to provide a meaningful and comprehensive quantitative analysis on the Draft EIR, the additonal information should be supplied in each of the above referenced areas to enable this task to be performed.

Should you have any questions or comments, please contact us.

Very truly yours,

VANASSE/HANGEN



Robert D. Vanasse, P.E.
Principal

RDV/pal

Charles River Watershed Association

RECEIVED
DEC 16 1985
OFFICE OF THE SECRETARY OF
ENVIRONMENTAL AFFAIRS

December 13, 1985

Secretary James Hoyte
Executive Office of Environmental Affairs
100 Cambridge Street
Boston, Massachusetts 02202

ATTENTION: MEPA Unit

REFERENCE: EOEA #5625 Massachusetts General Hospital

Having reviewed the Draft Environmental Impact Report for MGH facilities replacement, CRWA has the following comments:

- We are concerned that the issue of Charles River waterfront aesthetics, explicitly mentioned in EOEA's scope requirements, has been glossed over. The proponent has done extensive research on the effects of the proposed structures on views of the Charles from private property at Charl River Park, but where is the public interest in aesthetics at public parks addressed? We are told that Charles Street will appear less canyonized than it does at present when existing buildings are replaced, but there are no before/after views from Charlesbank Playground to substantiate this. CRWA would like to see graphics of this nature in the final EIR.

- CRWA is also concerned about MGH's long term plans for parking. For some time, we have been pressing for elimination of open parking lots along the river in the vicinity of the hospital. Because there are several construction projects planned for the West End in the next few years, it appears that the pressures on these parking lots will becom even more intense. The Draft EIR does not include a discussion of how these other developments will collectively affect the current unsatisfactory parking situation. CRWA would like to see explicit long term plans for the replacement of spaces lost through the potential Nashua Street/Charles Street Jail land swap, for example. Should the land swap not take place, some of the Nashua Street lot's capacity will be temporarily lost during Central Artery reconstruction. The final EIR should address these contingencies.

Sincerely,

Cassie Thomas

Cassie Thomas
Environmental Assistant

Metropolitan Area Planning Council

110 Tremont Street Boston, Massachusetts 02108 (617)-451-2770

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December 23, 1985

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DEC 24 1985

The Honorable James S. Hoyte, Secretary
Executive Office of Environmental Affairs
100 Cambridge Street
Boston, MA 02202

Attention: MEPA Unit

RE: Massachusetts General Hospital Facilities Replacement
(MAPC #DEIR-86-11, Received November 25, 1985) EOEA #5625

Dear Secretary Hoyte:

In accordance with the provisions of Chapter 30, Section 62, of the Massachusetts General Laws, the Council has reviewed the Draft Environmental Impact Report on Massachusetts General Hospital Facilities Replacement and wishes to submit the following comments for your consideration.

In general, the DEIR adequately describes environmental impacts. The MAPC anticipates that MGH will honor the City of Boston's requests, as stated in Mr. Dimino's comments. Specifically, a commitment is requested that MGH provide traffic enforcement necessary to prevent construction-related effects on adjacent streets and that MGH work with the City to address peak-hour congestion on Cambridge Street.

MAPC favors the MGH action of 7/19/85 to phase out parking subsidies for commuters over the next few years. This should contribute postively toward reducing MGH's share of peak-hour commuter traffic. The operation of shuttle bus service from North Station is also commendable.

Regulations for disposal of radiological wastes, toxic/chemical wastes, and biological wastes are cited on page 6-151. The comment, "Trace amounts of blood and other substances may be flushed down special drains" in paragraph 3, page 6-151, needs clarification.

Sincerely,

Joel B. Bard

Joel B. Bard
General Counsel/Assistant Director

JBB/CM/mlm
(G)
cc: Richard Dimino, MAPC Rep., Boston
Alfred Howard, BRA
Mass General Hospital
HMM Associates
Cathy Meyers, MAPC Staff

William C. Sawyer, President Frank E. Baxter, Vice-President Marjorie A. Davis, Secretary Franklin G. Ching, Treasurer
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Metropolitan Area Planning Council

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DATE: November 25, 1985

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DEC 19 1985

I.D. #: DEIR-86-11

TO: Richard Dimino

COMMUNITY: Boston

Enclosed is a description of the project referenced below.

The Council requests that you consider whether this report adequately describes the project's impact upon your community and addresses significant environmental benefits and potential damages.

PROJECT TITLE: Mass. General Hospital -- Facilities Replacement

THE COUNCIL HAS ONLY 20 CALENDAR DAYS TO FILE COMMENT WITH E.O.E.A. TO MEET THIS DEADLINE, YOUR COMMENTS MUST BE RECEIVED AT THE MAPC BY December 19, 1985

- [xxx] ADEQUATELY DESCRIBES ENVIRONMENTAL IMPACTS
- [ ] MERITS FURTHER ENVIRONMENTAL STUDY
- [ ] NEED MORE INFORMATION

EXPLANATORY COMMENTS:

Please See Attached Sheet.

SIGNATURE: Paul V Dimino

DATE: 12/9/85

APPENDICES

APPENDIX A

MASSACHUSETTS GENERAL HOSPITAL - FACILITIES REPLACEMENT

FINAL ENVIRONMENTAL IMPACT REPORT

CIRCULATION LIST

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Sun Oil Company of Pennsylvania
296 Cambridge Street
Boston, MA 02114

Edward W. Tackeff
Trustee of Tracy Realty Trust
286 Cambridge Street, Box 116
Boston, MA 02114

XXXX Adequately Describes Environmental Impacts

The DEIR on the MGH Facilities Replacement project appears to have met the requests from the City for more information on its impacts which were requested. There are two areas which require a committment to an on-going review process between the City and MGH.

First, MGH expresses in its DEIR that the impact of construction traffic on surrounding streets will not be significant since most of the construction work in this project is internal to the MGH campus. The City feels that MGH should make a committment to provide the traffic enforcement necessary to prevent construction related traffic from effecting traffic flow on the streets around MGH.

The traffic flow calculations provided by MGH in their DEIR indicate that although service levels of traffic flow on Cambridge St. indicate fairly good traffic conditions, the City is aware of severe, recurring peak hour traffic flow situations on this artery. The City would like MGH to work with the Traffic and Parking Department to address this matter of traffic flow on Cambridge st. during peak hours.

Metropolitan Area Planning Council

110 Tremont Street Boston, Massachusetts 02108 (617)-451-2770

Serving 101 Cities & Towns in Metropolitan Boston

DATE: November 25, 1985

RECEIVED

I.D. #: DEIR-86-11

DEC 23 1985

TO: Alfred Howard

COMMUNITY: BRA

Enclosed is a description of the project referenced below.

The Council requests that you consider whether this report adequately describes the project's impact upon your community and addresses significant environmental benefits and potential damages.

PROJECT TITLE: Mass. General Hospital -- Facilities Replacement

THE COUNCIL HAS ONLY 20 CALENDAR DAYS TO FILE COMMENT WITH E.O.E.A. TO MEET THIS DEADLINE, YOUR COMMENTS MUST BE RECEIVED AT THE MAPC BY December 19, 1985

[X] ADEQUATELY DESCRIBES ENVIRONMENTAL IMPACTS

[ ] MERITS FURTHER ENVIRONMENTAL STUDY

[ ] NEED MORE INFORMATION

EXPLANATORY COMMENTS:

Implementation of this project has required MGH to amend its Planned Development Area designation. Following extensive review, as noted in the DEIR, the BRA determined that this project is in conformance with the PDA plans and approved the amendment.

Although the EIR indicates that the new facilities would contain the same number of beds as are located in the buildings to be replace it is our understanding that the Determination of Need application filed with the Department of Public Health calls for approximately 60 fewer beds than the EIR would indicate. If this is the case, then th should be some opportunities for possible modification in building design, height, and massing which could improve future environmental

(continued...)

SIGNATURE:

DATE: December 20, 1985

Mass. General Hospital -- Facilities Replacement (continued)

conditions and reduce such impacts as shadow, wind, and view obstruction of the Charles River Basin. The BRA will continue to have design review over this project.

The major adverse impact from this project is the creation of adverse pedestrian level wind conditions. Although the wind tunnel results indicate a generally windy environment around the hospital complex, the project will increase wind velocities at several locations (while reducing them at several others) and will result in new exceedances of the BRA acceptability criterion at two locations, where also the greatest increases were recorded. In addition, the unacceptable winds at the northeast corner of the Charles and Fruit Streets intersection, where the highest effective gust velocity under existing conditions (40 mph) was recorded, will be further exacerbated by this project. The exceedances at stations 19 and 23 are associated with accelerated wind flow through the open passage under the deck at the proposed main entrance between Charles and Fruit Streets. Further study of the problem and design changes are necessary to reduce these and other excessive wind speeds to levels which comply with the BRA guidance level, particularly since the locations of the exceedances also are along major pedestrian access routes to the hospital facilities.

With respect to traffic impacts, the EIR indicates that access demands for the new development would be virtually the same as today, save for 80 additional employees (±32 peak-hour vehicles) in the research component. Overall, it appears that the access impact of the project will not be conspicuous.

The EIR also indicates that the existing garage facilities are oversaturated to a degree, as evidenced by the number of "no stays" during the mid-day period. This would suggest that employee parking within the two garages is at a level which does not allow sufficiently for visitor service. Therefore, we would recommend that MGH adopt a policy of holding some number of spaces open for visitor parking after workers have arrived.

We are pleased that the hospital has responded positively to the parking concerns expressed in our comment letter on the ENF. By removing the subsidization of new employee parking and making parking fees consistent with current market rates, internal demand should be reduced, thus freeing spaces for the growing number of visitors and patients coming to the MGH for ambulatory care. We would request, however, that the Final EIR indicate the schedule of raising parking fees in general and having specific rates favoring short-term use. While the MBTA pass program also was mentioned, its nature was not specified. For example, to what extent are passes subsidized by MGH and what is their availability?

Boston Water and Sewer Commission

10 Post Office Square
Boston, Massachusetts 02109
617-426-6046

December 31, 1985

RECEIVED
DEC 31 1985
OFFICE OF THE SECRETARY OF ENVIRONMENTAL AFFAIRS

Secretary James S. Hoyte
Executive Office of Environmental Affairs
20th floor
100 Cambridge Street
Boston, Massachusetts 02202

Attention: MEPA Unit

RE: Draft Environmental Impact Report - EOEA #5625

Dear Secretary Hoyte:

In regard to the above-referenced project Draft EIR, the Boston Water and Sewer Commission has the following comments:

1. The description of flow transport to the Deer Island plant is incorrect. There is no discussion on the impact of the projected increased flows from the new MGH buildings on the treatment plant.

2. The Regulatory Requirements listed on Page 3-8 are incomplete. No BWSC requirements are named.

3. The figures 6.9.1 and 6.9.2 showing sewer lines are illegible. Readable maps are needed showing the existing and proposed public sewers, drains and connections serving the site.

4. There is no discussion as the adequacy of the existing system to handle the increased flows, whether existing services will be used or new connections will be needed, or how on-site drainage is managed. No mitigating measures are proposed.

5. The EIR states that it is expected to take eight years to construct the new MGH facilities. A schedule is needed indicating when the increased flows will be experienced.

6. There is no discussion at all about water.

Very truly yours,

John P. Sullivan, Jr., P.E.

3. RESPONSES TO COMMENTS

3.0 RESPONSES TO COMMENTS

Introduction

Responses to the following comments were made pursuant to the MEPA Certificate on the DEIR issued January 2, 1986 (see Section 1.0). Comments were received from organizations and agencies during the comment period of November 15, 1985 to January 2, 1986. The responses to all comments are ordered as follows:

3.1 Overview

3.2 Charles River Park and Hawthorne Place Condominiums - comment by its attorney Goodwin, Proctor & Hoar dated December 26, 1985.

3.3 Charles River Park and Hawthorne Place Condominiums - comment by its engineers Vanasse/Hangen dated December 26, 1985 and addressed to attorney Susan Cooke of Goodwin, Proctor & Hoar.

3.4 Charles River Watershed Association - comment by Cassie Thomas dated December 13, 1985.

3.5 Metropolitan Area Planning Council (MAPC) - comment by Joel B. Bard dated December 23, 1985.

3.6 Boston Water and Sewer Commission (BWSC) - comment by John P. Sullivan dated December 31, 1985.

3.1 Overview

This project, its impacts and alternatives, is best understood in the context of Massachusetts General Hospital's mission and purpose and its relationship to changes in the nationwide health care delivery system in which it and all hospitals operate.

Originally chartered by the Commonwealth in 1811, Massachusetts General was New England's first hospital. At the forefront of the evolution of modern medical care, the hospital is one of the leading medical centers and teaching hospitals in the world with an international reputation for clinical care and biomedical research. It was instrumental in the first use of ether as an anesthetic in 1846, the development of artificial skin for burn patients in 1981, the use of proton beam therapy for cancer patients in 1982, and in 1905 it created the first hospital based social service department. In 1983-1984 the hospital was the recipient of over 50 million dollars in research grants designed to improve medical care technology and delivery.

Since its inception, the hospital's mission and purpose has been to serve people, regardless of economic status, providing in recent years over 16 million dollars of free care annually. In 1983, the hospital treated 31,033 people, 90% of whom were residents of Massachusetts and over 30% of whom were residents of Boston. It is the primary care provider for Beacon Hill, Charlestown, The North End, Revere, Chelsea, Somerville and six other communities.

Massachusetts General does not exist in isolation. To the contrary, it operates within a nationwide health care system which has undergone profound and lasting changes. Substantial increases in the nation's expenditures for health care have resulted in a major realignment of the manner in which health care is delivered and paid for. Conversion of the federal health care insurance system (Medicare) from cost reimbursement to a prospective payment system based on Diagnosis Related Groups (DRGs) and the advent and rapid growth of managed care and other alterative delivery systems (Health Maintenance Organizations, Preferred Provider Organizations, ambulatory care centers, etc.) have created a system which rewards cost efficiency and penalizes cost inefficiency. This in turn has led to earlier discharges, decreased lengths of stay, emphasis on outpatient and ambulatory services and renewed efforts to become more cost effective while continuing to maintain and enhance the quality of care delivered to patients.

It is the above context within which this project must be viewed. So-called "hotel" beds do not represent the type of use typically associated with the word "hotel". To the contrary, they represent an intrinsic and necessary part of the continuum of health care delivery to patients served by the hospital. Project alternatives that are rejected or adopted in part on the basis of cost and service delivery efficiency do not represent "profit margin" decisions. Instead, alternatives adopted by the hospital represent its efforts to enhance the quality of medical care delivery while conserving scarce resources to serve those in need who lack the ability to pay. The project, as described, represents a necessary evolution of the hospital's services to the public.

3.2 Charles River Park and Hawthorne Place Condominium - (hereinafter referred to as CRP).

3.2.1 CRP Comment: IA - Inadequate Discussion of Research Building

Response: The Research Building is a separate project, not subject to the Determination of Need process, and therefore not subject to MEPA. However, the ENF Certificate noted that the Research Building should be considered along with the existing MGH campus as part of the "cumulative effect" in the EIR. The reason is that the Research Building will be built during the same span of time as the Facilities Replacement project. The need for the Research Buiding arises from the fact that laboratory space in existing buildings to be demolished as part of the Facilities Replacement project will not be replaced within the new inpatient buildings. The Research Building was adequately described on page 3-6 of the DEIR and furthermore was part of the analysis which measured

the overall project's impact on traffic, parking, wind, shadow, views and aesthetics, open space, pedestrian circulation, historic resources, and sewage. However, a supplemental description of the Research Building follows:

The Research Building is proposed to be located at the corner of Parkman Street and Blossom Street, south of the Bartlett Research Building and above the service building and the site where the hospital stores its oxygen tanks. The proposed building will not displace the tanks since the plan calls for the tanks to remain in a specially designed arcade that extends two stories within the building envelope.

The building itself will actually be an extension of the Bartlett and Wellman buildings, in its form and function. It will include a six level portion where it abuts the Bartlett, with connecting corridors and a continuation of the exterior facade and it will have an eleven story tower that will match the Wellman structure and provide for architectural balance and symmetry. But unlike the Wellman building, the new structure will rise to eleven stories only at its southwest corner, comprising 5,452 gross square feet out of a total foot-print of over 19,000 gross square feet.

Visually the Research Building will blend into the facades of the Wellman and Bartlett buildings on its west facing side (see Figure 1 depicting a rendering

of the proposed building and Figure 2 showing a photograph of the Wellman Building from the west). Along Blossom Street, the proposed building will maintain the facade and height of the Bartlett Building which is six stories in height. The Research Building's first six stories will be most visible from Blossom Street, with the seventh through eleventh stories being set back towards the Service Building (see Figure 3 for elevation drawings). The design intent is to maintain a similar facade as both Bartlett and Wellman, with the eleven story portion on the west side of the building serving as an anchor to provide symmetry with respect to the Wellman Building, and to maintain the same building line as the Bartlett Building on its east side.

Functionally, the new Research Building will consolidate uses that currently occur in several existing buildings that will be demolished as part of the Facilities Replacement project.

The library use will occupy the first three levels for ease of access. It will include reading rooms, carrels, catalogue and periodical reference areas, and staff offices. This represents an expansion of library space to serve research activities on the MGH campus.

The laboratory space will include replacement space that will be lost to demolitian of Vincent-Burnham, Baker and the Rehabilitation buildings. The type of research will include programs in neuro-biological science, immunology, endocrinology, genetics, and basic studies of laser effects on tissues.

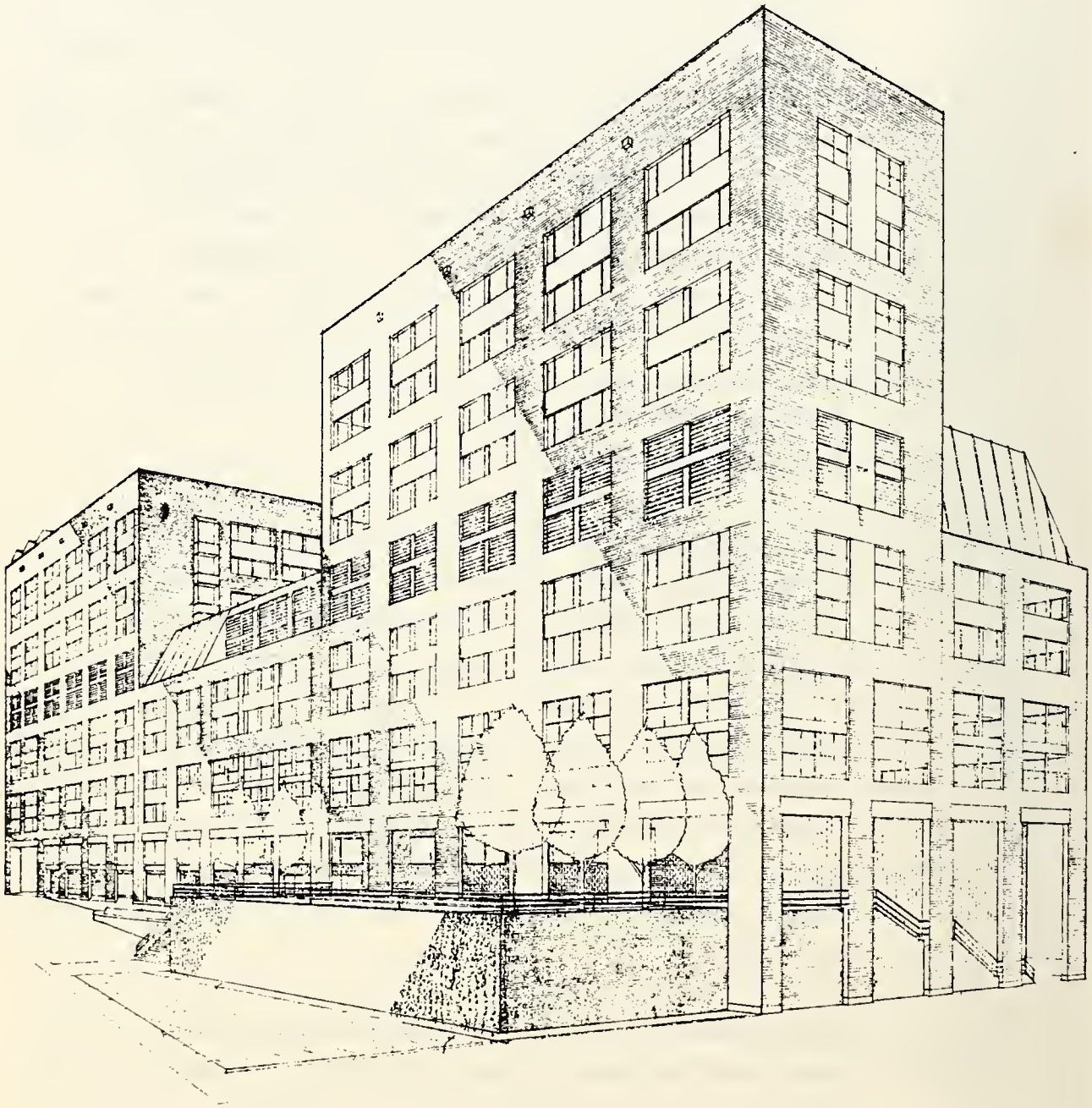
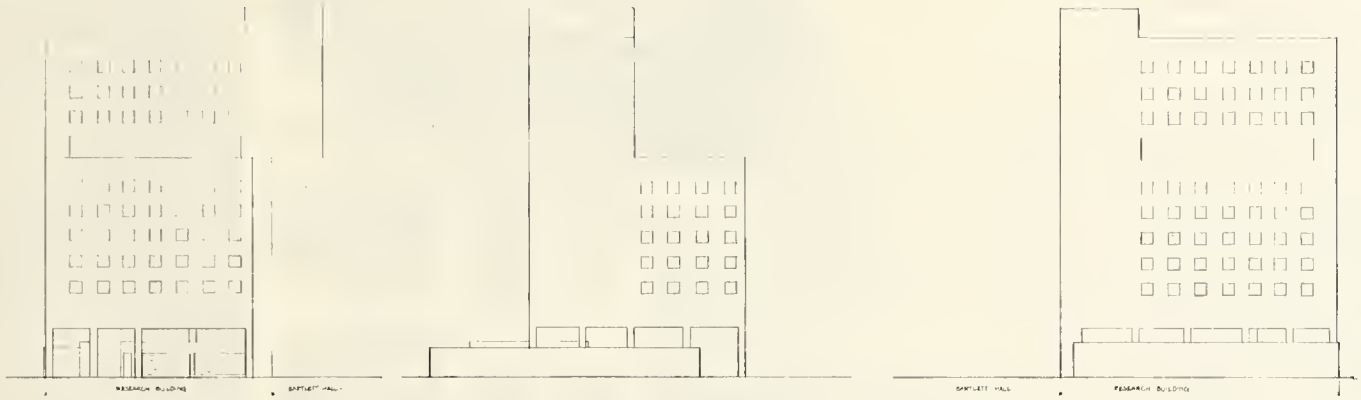


FIGURE 1 RENDERING OF PROPOSED RESEARCH BUILDING

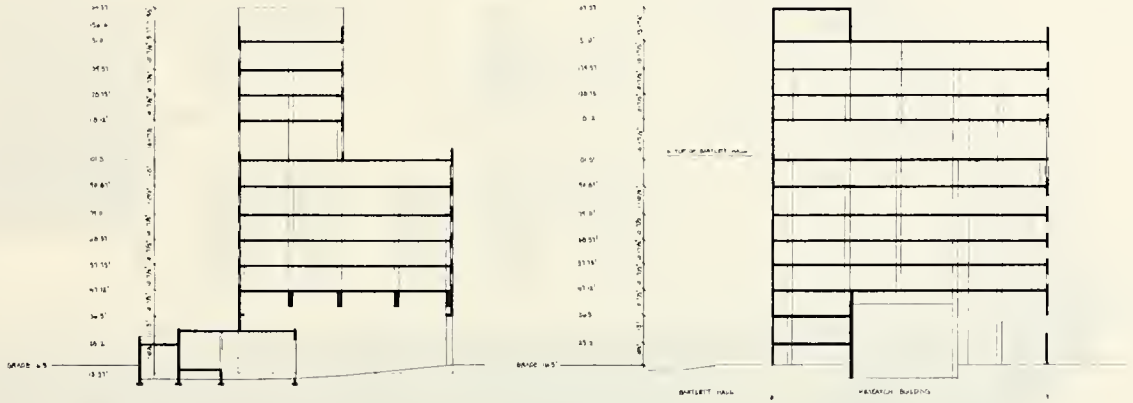
FIGURE 2 PHOTOGRAPH OF WELLMAN BUILDING



EAST ELEVATION

SOUTH ELEVATION

WEST ELEVATION



SECTION A-A

SECTION B-B

FIGURE 3 PROPOSED RESEARCH BUILDING ELEVATIONS AND SECTIONS

The last full floor will be at level six. Level seven will be devoted entirely to mechanical equipment and the roof of the six story portion of the building. The eighth through eleventh floors will include some laboratory space as described above but for the most part will accommodate staff offices. These offices represent some expansion of space but are primarily intended to be replacement space resulting from the demolition of the older buildings in the Facilities Replacement project.

Of the total useage of the Research Building, about 75% of the new floor space represents relocated facilities, particularly in the library and laboratory uses. The new or expanded uses will be about 25% of the new floor space primarily in office use and to some extent in laboratory uses. For example, there will be an additional 10,000 net square feet of space devoted to new radiology and gynecology research. It is not expected that the new space will generate any more than 80 new employees.

The new Research Building will draw its energy from the underground steam that services other buildings on campus. Other mechanical and cooling equipment will be enclosed on the seventh floor of the proposed building.

Project Alternatives - Given that the Research Building's main purposes are to replace space in existing Vincent-Burnham, Baker, Rehabilitation Building and Temporary I Building, and to consolidate research and library uses in conjunction with the Bartlett and Wellman Buildings, the alternatives can only be considered in the context

of the entire Facilities Replacement project. See Section 3.2.5 of this FEIR for an expanded discussion of the alternatives. It is conceivable that one or more of the alternatives that called for the rehabilitation of existing Vincent/Burnham and the Baker building could have kept some of the research space in place. However, these alternatives would not have realized the MGH's objectives of consolidating research and library uses to take full advantage of the Wellman and Bartlett research buildings.

The preferred alternative and the proposal to construct the Research Building as described above met the following objectives:

- To consolidate patient care in connecting buildings for purposes of efficiency and enhancement of the quality of nursing care.

- To separate research uses from day-to-day nursing care.

- To consolidate research close to ongoing research at the Edwards and Wellman Buildings.

- To allow for expansion of office and laboratory research space.

Oxygen Tanks - As part of the Research Building's program, the hospital decided that its existing tanks can remain where they are and that the new building could be placed over it. An arcade extending to the second level will provide a roof over the tanks although the area will be open (i.e.,

no walls to enclose it) except for support columns. The inner walls of the arcade and the roof will consist of 4 hour fire walls to protect the new building. Otherwise the tanks will be accessible and useable as they are at present time. All applicable safety rules and regulations will be observed to maintain safe operation of the oxygen tanks.

Service Building - The existing service building will likewise be left intact and access will be maintained at the lower level.

Consideration of Impacts

The DEIR considered the Research Building as an element in the entire Facilities Replacement project and evaluated these in the aggregate. These are as follows:

- Transportation - beginning on page 6-1 of the DEIR, the text states that the traffic analysis considers the two parts of the project which includes, as the second part, "the construction of a Research Building on the MGH campus". Figure 6.1.2 shows project access and site circulation which includes the Research Building at the corner of Blossom Street and Parkman Street. The discussion on traffic impact summary likewise addresses the Research Building as follows:

  "The Research Building will support a staff of approximately 80 additional people and will result in a similar number of daily person

trips to and from the site. The mode of arrival of these person-trips will be fairly evenly distributed, with approximately 40% made by automobile and another 40% by mass transit. An estimated 20% will use other modes (i.e., walking, bicycle, shuttle bus) as the primary means of transportation to the site. Thus, approximately 32 vehicle trips will be generated by the Research Building during each peak hour period (i.e., 32 inbound trips in the morning and 32 outbound trips in the late afternoon)." (pp. 6-53 - 6-54 of the DEIR).

Therefore, it can be considered that the entire discussion of transportation impacts from pp. 6-1 to 6-65 of the DEIR addressed the Research Building as part of the total replacement program.

- Wind - The discussion on wind impact is on pp. 6-66 through 6-94 of the DEIR. Again, within the context of the overall project, the Research Building was part of the wind tunnel testing and analysis. The DEIR noted that the greatest wind impact occurred in the "hospital's northern and western boundaries as a result of these areas having an open exposure to the wind" (p. 6-93 DEIR). As a result of this observation, the proposed Research Building which is on the eastern side of the campus was not deemed to be a "hot spot."

- Shadow - The discussion on shadows including all the diagrams in Figures 6.4.1 through 6.4.9 of the DEIR include the Research Building.

- Views and Aesthetics - Due to its location on the eastern edge of the MGH campus, the Research Building will not block any existing views. It will be no higher than the highest point of the Wellman Building and the Wang Ambulatory Care Center to the west. Views that may be blocked are already blocked by these buildings. Furthermore, it will not impede the views of the Bulfinch building. From an aesthetic point of view the new building will blend in with the Bartlett and Wellman buildings, providing a continuous and harmonious facade.

- Construction Impacts - As it was noted earlier, the Research Building will be built over the existing oxygen tanks. During construction, these tanks will not be moved, rather the building will be built around them. The tanks will remain in operation throughout construction with normal fill-ups and continual distribution through underground pipes. All underground lines have been identified to avoid accidental disturbance during construction. The tanks themselves will be protected by appropriate shielding during the early stages of construction. Once the second floor is built, a slab will cover the area of the tanks and provide additional protection.

  The tanks only contain oxygen; there are no toxic or explosive gases. Oxygen is not in itself combustible but will substantially increase the rate of combustion if large amounts of it are exposed to fire. Obviously

any rupturing of the tanks would be destructive, however, the potential for accidents during the constructon of the new Reserach Building will be minimized through appropriate precautionary measures. These measures would include complete shielding of the tanks so that falling debris will not strike the tanks themselves. The alternative of moving the tanks either permanently or temporarily has a greater potential for oxygen leakage and any interruption in oxygen for medical and surgical needs would have a deleterious impact on patient care.

3.2.2 CRP Comment: IB - Failure to Discuss Hotel Use

Response: As previously stated in Section 3.1 of this FEIR, the so-called "hotel" use of Levels 18 through 21 of the 26-story patient care building is an integral part of the hospital's delivery of medical services to patients. Day patients who do not require, and inpatients who no longer require, a level of medical service intensity provided in licensed inpatient beds, will utilize these facilities whose proximity to medical floors and services best assure an appropriate continuity of care. Additionally these facilities will be used by family members whose emotional support and physical proximity is essential to the healing process and patients' well-being. Examples of potential users of these rooms include cancer patients receiving radiation therapy twice per day who are too weak to leave the hospital, parents of pediatric patients in critical condition, and frail or elderly patients who no longer need intense medical services but may be too weak immediately following discharge to comfortably travel any distance.

The hospital is planning to reduce its medical beds by 105. The 80 bedrooms for overnight accommodations will allow flexibility in the pre-admission and post-discharge of patients who now have to occupy medical beds, even if they do not need nursing care. To the extent that certain out-of-state patients and families of pediatric patients use the overnight facilities, there will be less traffic generation than if these people had to make daily return trips to the hospital. The facilities will not be available to the general public for any use not associated with hospital services.

3.2.3 CRP Comment: IC - Inadequate Discussion of Patient-Care Usage

Response: Inpatient facilities are described on pages 3-1 through 3-6 in the DEIR, which include maps showing the proposed site plan, a photograph of the model, a rendering of elevation views and a map depicting buildings that will be removed. Moreover, the DON provides a lengthy description of the various types of uses, both as they presently exist and how they will be situated in the proposed facilities. However, a supplementary description of the proposed inpatient building follows.

In order to meet the MGH's objectives for improving the delivery and efficiency in patient care, the facilities replacement project proposes to remove the existing temporary Building #1, Baker Building, the Rehabilatation Building, Vincent/Burnham, Phillips House and the Clinics Building. These will be replaced by a complex of three new buildings that will connect one to another and will also connect to

the existing White and Gray/Bigelow buildings. The combined new construction and use of existing space will result in a total of 977 medical/surgical beds for patient care and 80 bedrooms for non-medical overnight accommodations for the safety and convenience of pre-admission and post-discharge patients, out-of-state patients awaiting surgery or other medical treatment, parents/families of pediatric and other patients where the presence of the parent/adult guardian is necessary for the patient's recovery and well-being, and for same day surgery patients who do not need nursing care but are unable to be physically moved out of the hospital premises.

The complex of new construction comprises 3 buildings. The uses of each building along with the connecting White and Gray/Bigelow buildings are described below:

- Building One - a 26 story building which tapers to the top. It will contain medical/surgical beds and bedrooms for overnight accommodations. These will be located on levels 3A and up. Levels 1 and 2 will contain support spaces.

- Building Two - a 16 story building which will be used almost entirely for medical/surgical beds.

- Building Three - a 6 story "wrap-around" building that will connect all the new construction to White and Gray/Bigelow. There are no patient units in this structure; it will, in combination with levels 1 through 4 of Building One and Two, provide space for the

lobby, administrative services, security, credit union, coffee/gift/flower shops, Chapel, social services, sports medicine, gynecological services, pediatric services, receiving platform, cafeteria, and inpatient and general food services.

- Existing Buildings - The connectors to existing space is an integral part of the replacement program. White and Gray/Bigelow will also contain medical/surgical beds.

Summary

All new construction are included in three buildings that connect to each other and to the existing buildings that will be renovated. Floor plans of the following representative levels are also attached:

- Level 1 - Showing ground-floor use of all three buildings with uses depicted.

- Level 3A - Showing all three buildings with cafeteria and connecting corridors to existing buildings.

- Level 8 - Showing Buildings One and Two only, showing proposed uses, connecting corridors to each other and to existing buildings.

- Level 16 - Showing Building One and roof of Building Two. Nursing units are arranged around a core.

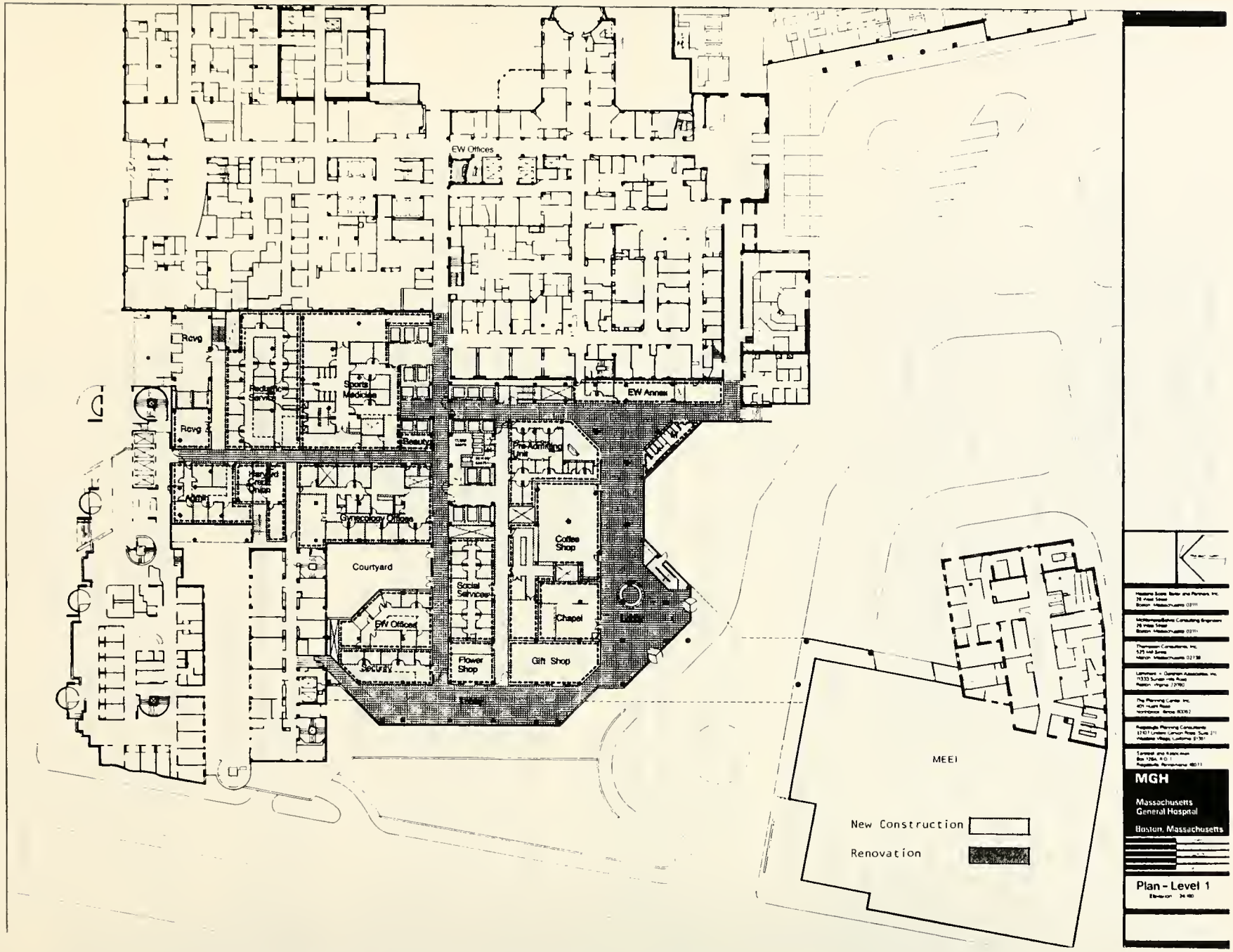


FIGURE 4 FLOOR PLAN OF PROPOSED INPATIENT FACILITIES - LEVEL 1

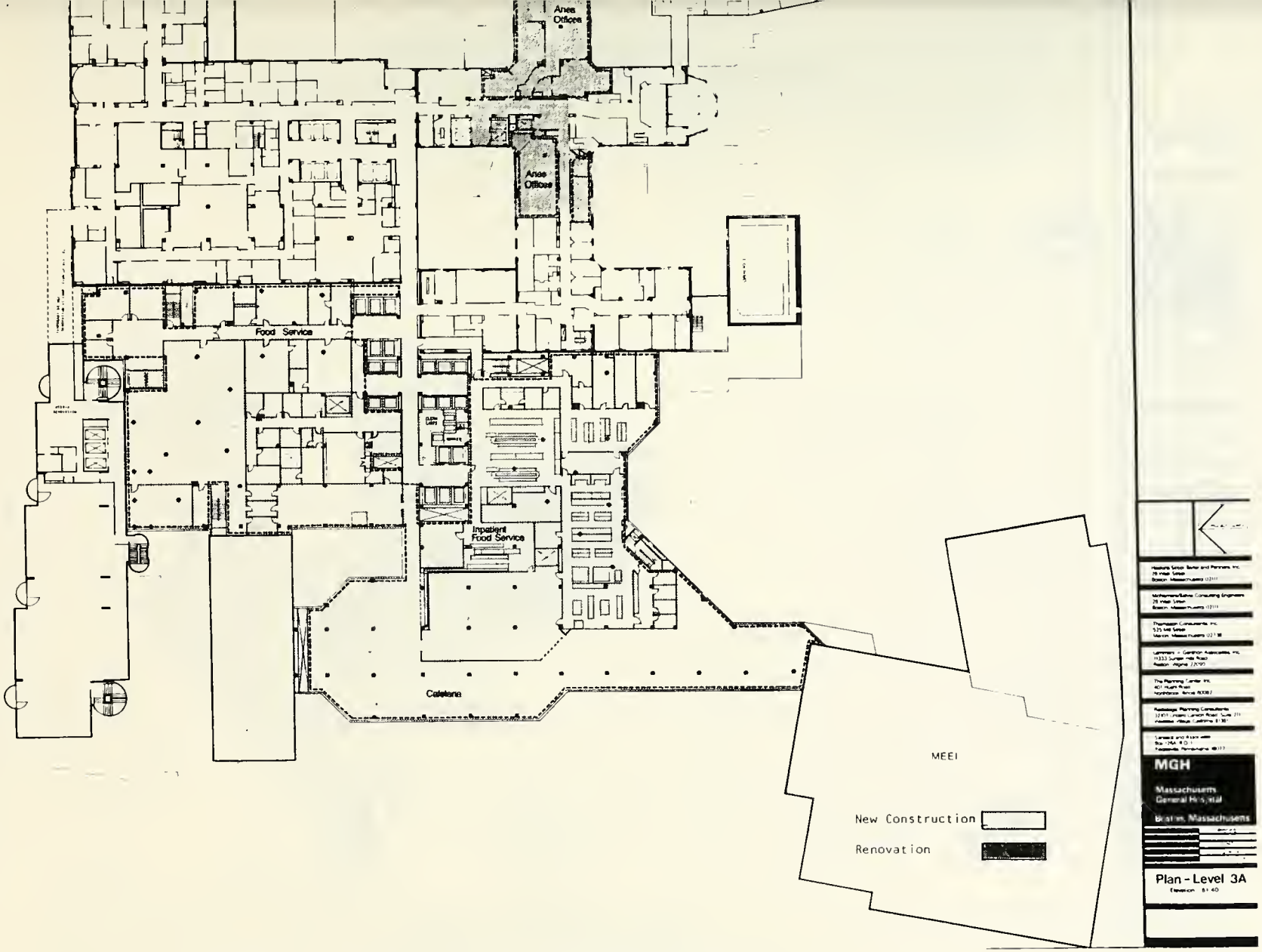


FIGURE 5 FLOOR PLAN OF PROPOSED INPATIENT FACILITIES - LEVEL 3A

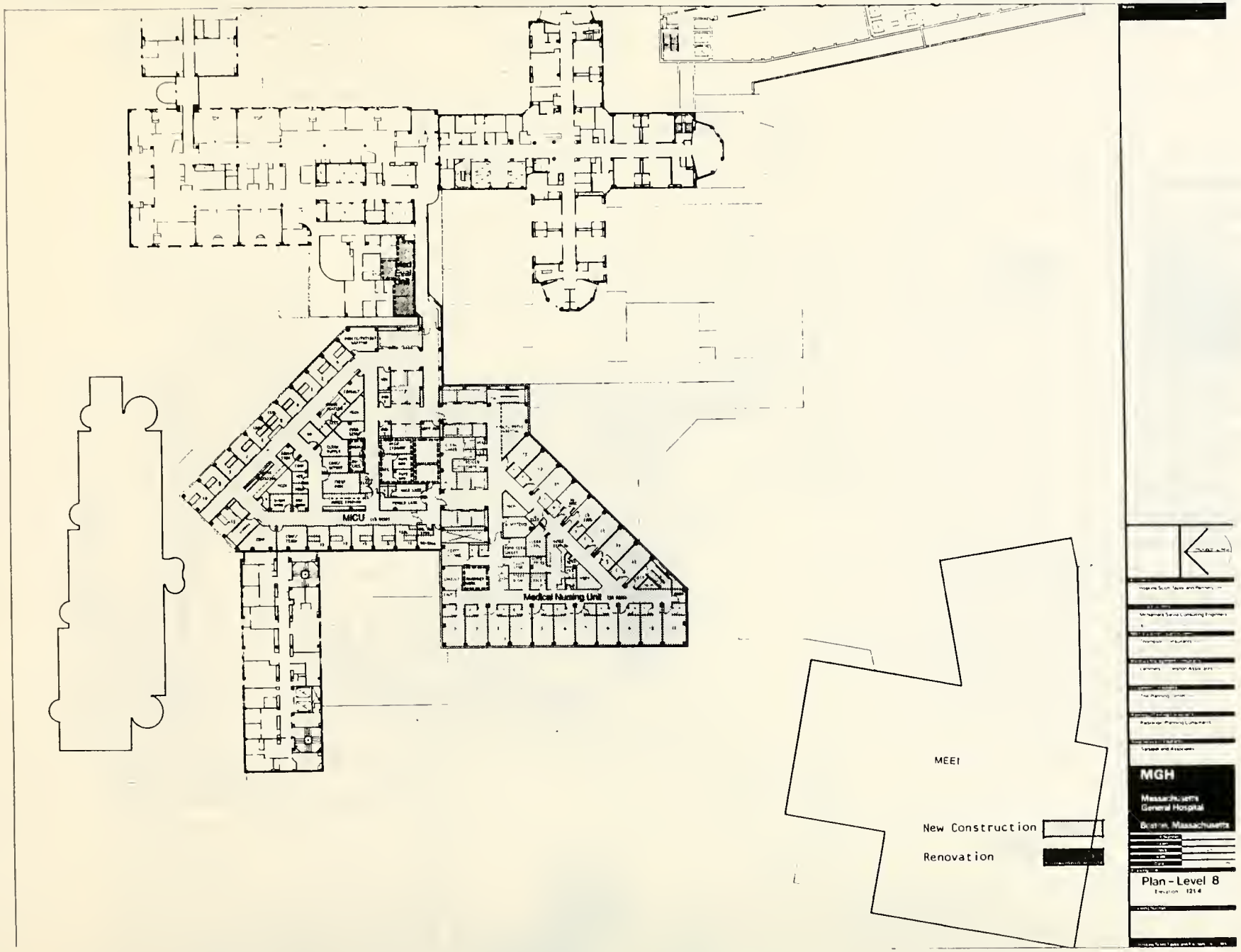


FIGURE 6 FLOOR PLAN OF PROPOSED INPATIENT FACILITIES - LEVEL 8

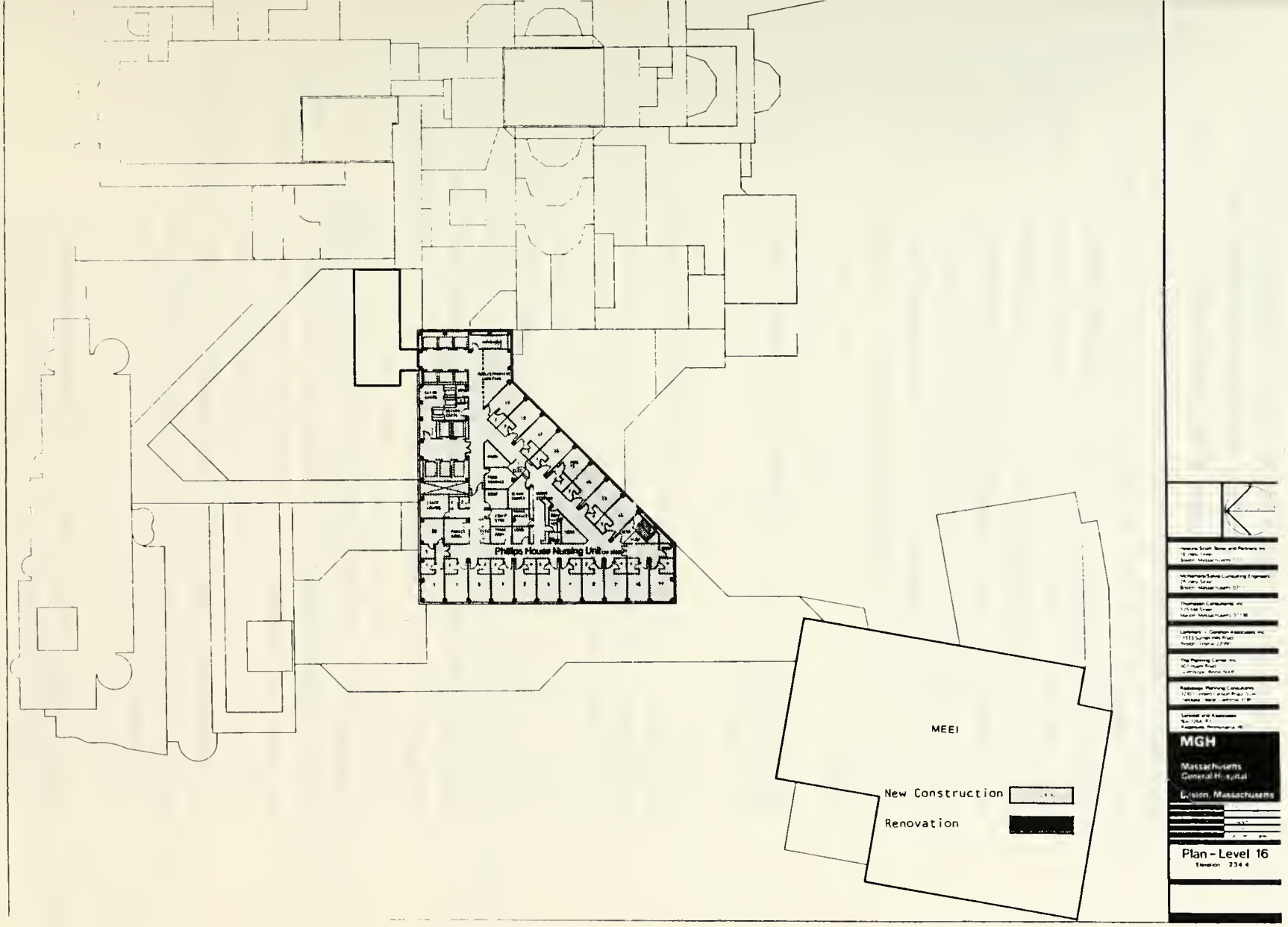


FIGURE 7 FLOOR PLAN OF PROPOSED INPATIENT FACILITIES - LEVEL 16

By combining the inpatient facilities, the hospital can keep all 977 beds and the 80 bedrooms for overnight accommodations in close proximity to one another. Connecting corridors and elevator cores will keep all vital connections that will promote greater efficiency and better patient care. In contrast with the existing situation, which includes several outmoded buildings, the replacement project will meet all the objectives that the hospital set forth for itself to continue its high quality care and to assure Massachusetts General Hospital its place as a leading institution with a world-wide reputation.

3.2.4 CRP Comment: ID - Failure to Discuss Energy Source for Heating and Cooling

Response: The Massachusetts General Hospital purchases steam from the Boston Edison Company (a publically regulated utility) to meet all its energy requirements. The Facilities Replacement project will likewise use this energy source. No power plant or heating system using fossil fuels is being planned for the project. In the event of power losses or other emergency situations, the hospital will require up to three 1000 KW, 1250 KVA generators. These generators will be fueled by diesel fuel and will include exhaust provisions and automatic control of air supply and exhaust. These units will be used only on a stand-by basis with a minimum run time. To the extent that the generators may need DEQE approvals, normal procedures will be followed.

3.2.5 CRP Comment: II - Project Alternatives

Response: Several alternatives were considered prior to selecting the preferred alternatives. All alternatives were considered in light of several important planning criteria. These are:

Urban design
Open space
Traffic, access, circulation
Maintaining operations
Phasing and duration of construction
Bed replacement
Support space replacement
Floor level compatibility
Operational integration
Facilities environment
Code compliance
Capital cost
Operating cost

These planning criteria are defined as follows:

Urban Design - The impact of height, massing, and aesthetics is a key factor in evaluating alternative designs. Effects of wind and shadow both on the MGH campus and its abuttors are important criteria.

Open Space - The provision of open space at ground level is a key factor in considering the density of proposed development.

Traffic, Access and Circulation - Major considerations in evaluating traffic, access and circulation include the need to consolidate a main public entrance accessible to parking; the need to segregate public and emergency access; convenient and safe pedestrian circulation; and impact on traffic in the immediate vicinity.

Maintaining Operations - The selected Plan must allow MGH to substantially continue existing operations during the replacement of deficient facilities. Construction impacting existing facilities must be orchestrated to avoid interference with continuing operations.

Phasing and Duration of Construction - A single phase replacement of facilities would yield the maximum result at the earliest date. If a single phase of construction is not possible the extent and nature of phasing of construction become planning considerations.

Bed Replacement - A significant planning criterion is the ability of a plan to accommodate the replacement of existing beds at current standards of space per inpatient bed. Equally important is the physical configuration of the inpatient nursing unit relative to efficiency and economy of operation.

Support Space Replacement - In addition to replacement of inpatient beds, alternative plans must replace existing support space housed in buildings to be demolished. Much of this space is operational support space for departments such as dietary, pharmacy, radiology and materials management which are location-critical. Consolidation of operations in these departments requires both adequate space and appropriate locations relative to existing facilities for access.

Floor Level Compatibility - Current MGH facilities are in buildings which have different floor levels,

making it impossible to travel between buildings at the maximum number of levels. As a result, transport related operations are expensive and time consuming. A major planning criterion is the provision of compatible floor levels allowing the horizontal movement through the facilities at the maximum number of levels.

Operational Integration - A related criterion is the ability to consolidate functional departments. Instead of three food service operations, one integrated facility yields enormous operational cost savings. The same is the case for pharmacy, radiology, materials management and other key support departments.

Facilities Environment - The facilities environment of alternative plans is an important factor. In particular, minimum requirements for light and view from inpatient facilities is a planning criterion.

Code Compliance - Reuse of existing non-complying structures must be evaluated in terms of the ability to upgrade them to meet current codes.

Capital Cost - Capital cost is an important criterion in evaluating alternate schemes.

Operating Cost - As important, and perhaps more so in a hospital, are long term operating costs. Facilities alternatives which provide major operational cost savings should be given preference over those which do not.

Alternatives Evaluated - During the course of planning for the project, a great many alternative designs were investigated in varying levels of

detail depending on their merits. Based on the evaluation of these alternatives, using the described criteria, the proposed plan was deemed to be the plan which best met all those criteria. The alternative plans fell into the following generic groupings. A number of variations were explored in each grouping of alternatives.

Alternatives utilizing existing Charles River Park Property north of the existing MGH Campus across Blossom Street - A number of alternatives were investigated which used a tract of land across Blossom Street from MGH at Emerson Place which was offered for sale by Charles River Park. The alternatives included partial replacement of Baker, Phillips House, Vincent-Burnham, and Bulfinch beds on that site in tandem with new beds on the west side of the Main campus as well as total replacement of those beds on the CRP site. Ultimately none of these alternatives was feasible because CRP withdrew the site from the market. In addition, development on that site had significant problems relative to duplication of support functions, poor operational integration and high cost. Operating cost would be high because of the potential of duplicating services and long distance of travel. Capital cost would be high relative to site acquisition as well as cost of duplicated facilities. Both patient and staff access and circulation were among the poorest in the alternatives evaluated. Air rights development over Blossom Street was explored to alleviate some of the problems of remoteness and duplication of facilities, however such development has negative urban design implications and was not supported by the City of Boston. Total replacement of the beds in question also entailed demolition of existing housing and removal of that scarce

commodity from the market.

Alternatives which reuse existing inpatient structures for the same function - The initial evaluation of existing MGH structures identified the need to replace inpatient facilities in the Baker Building, Phillips House, Vincent-Burnham, and Bulfinch Buildings because of non-compliance with codes as well as other major physical inadequacies. The White Building and Gray-Bigelow Building were deemed to be adequate to serve inpatient functions for the foreseeable future once fitting out and renovation projects were completed. A series of alternatives were evaluated which entailed partial or total rehabilitation of the Baker Building, Phillips House, and/or the Vincent-Burnham Building for inpatient use. These alternatives were deemed to be unacceptable primarily because the resulting facilities did not provide adequately-sized nursing units which were economical to operate. In addition, because the floor levels of those buildings do not match floor levels in other existing buildings, it is impossible to integrate them operationally with existing levels in the White and Gray Buildings. Phasing of construction was extremely difficult because no alternate facilities were available to house beds while rehabilitation of existing beds was underway. The possibility of leasing space for interim inpatient units at the Massachusetts Eye and Ear Infirmary was explored and found not to be feasible. The cost of rehabilitation relative to the ultimate benefit was also very high.

Alternatives which entailed the reuse of existing non-inpatient buildings for inpatient functions - One series of alternatives entailed the renovation

of the upper levels of the Jackson Building for inpatient functions. Those levels currently are occupied by expensive research facilities for which the building was built. These alternatives were rejected because of the 'footprint' of the building is too small to accomodate economical nursing units and the cost of rehousing the research facilities and renovating for inpatient units would be extremely high.

Alternatives locating new inpatient facilities on the existing Clinics Building site - Alternatives locating inpatient facilities on the existing Clinics Building site were explored. The negative factors arguing against these schemes included difficulty of providing access to existing White and Gray Buildings on multiple levels without passing through existing inpatient units, distance from central support facilities, duplication of vertical transportation systems, density of development on a very congested public portion of the site, on-campus shadow impact, and phasing and construction duration problems. Existing functions would have to relocate from the Clinics Building prior to demolition and commencement of construction.

Alternatives locating new inpatient facilties on the Bulfinch Lawn - MGH looked at using the primary open space on campus, the Bulfinch Lawn, for inpatient facilities. The overriding objections to this option were related to the impact on the historical Bulfinch Building and the loss of a large portion of the only major existing open space on the campus which is perceived as an important amenity not only by MGH, but also the neighboring community.

Alternatives locating new inpatient facilities on the west side of the MGH Campus - New construction no higher than the existing buildings - Numerous alternatives were explored developing replacement facilities on the west side of the campus. One group of these limited height of new construction to the maximum height of existing MGH structures. The primary deficiencies of these schemes included the following common elements: inadequacy of replacement support space, location of inpatient units on lower levels of the construction without adequate light and view, and extremely dense development of the site. The "footprint" of the proposed structures would have been substantially larger than that of the preferred alternative, resulting in less open space and greater density at ground level. Phasing of construction in these schemes was difficult because the first stage of construction did not provide adequate beds to permit the demolition of the Baker Building. One alternate looked at in some detail involved building three nursing pods per floor on the sites of the existing Temporary One Building, Baker Building and Warren Building. The use of the Warren Building site is extremely expensive because it entails the demolition of a valuable existing research building for which there is no available alternate site. In addition, even if it were replaced, the duration of the inpatient replacement would be extended to a third phase increasing the duration of construction relative to two-phase alternates another three years. Operational cost benefits of the replacement facilities would be deferred for that period of time.

Alternatives locating new inpatient facilities on the west side of the MGH Campus - New construction height not limited by the height of the existing buildings - Plans locating the replacement facilities on the west side of the campus with varying height structures proved to be the best alternative when evaluated in light of the defined criteria. The heights of the structure are critical to solving the phasing problems. The limited site available for construction without tearing down existing inpatient facilities provide adequate space for an economical nursing unit of each floor. Allowing the height of the first building to rise above the existing structures permits the first building to have enough beds to accommodate existing Baker Building beds. Accordingly Baker can be vacated at the completion of the first building to free up the site for the second inpatient structure. The floor levels of the new structures can be designed to match existing White and Gray floor levels affording maximum access and operating cost efficiency. One primary vertical transportation core can serve both the new construction and the existing building, consolidating public access and circulation. This integration of existing and new structures in close proximity provides the opportunity to achieve major savings in operational cost. In the urban design review, The Boston Redevelopment Authority deemed the varying height structures to be preferable to a uniform height of structures which with the Massachusetts Eye and Ear Infirmary would create a "chinese wall.' By building the higher structure, substantial open space can be provided at ground level opening up the south and west sides of the campus to public access. Traffic flow is

facilitated by the addition of a driveway between North Grove Street and Charles Street reducing congestion along Fruit Street at the MEEI entry. The impact of the alternate on view and shadow was assessed in detail and found to be negligible. In summary, the selected alternative best meets the full range of planning criteria against which the project is measured.

3.2.6 CRP Comment: III A - Failure to Discuss Chapter 91 License.

Response: Chapter 91 of the Massachusetts General Laws, as amended in 1983, is designed to protect the public's and the Commonwealth's rights in tidelands. Chapter 91 defines certain rights in existing and former tidelands, depending upon the historical high and low water lines. In general, land seaward of primitive extreme low water (or 100 rods seaward of mean high) are Commonwealth tidelands, while land between Commonwealth tidelands and the mean high water line are private tidelands.

Each type of tideland has a set of rights associated with it. Rights for fishing, fowling and navigation are held in private tidelands. Commonwealth tidelands, on the other hand, are held in public trust, and projects permitted in such tidelands must demonstrate a "valid public purpose".

For the purposes of permitting, the DEQE Division of Wetlands and Waterways considers the following when evaluating proper public purpose:

- Public access and amenities
- Provision of public open space

Applicability of Chapter 91 - The site upon which the Massachusetts General Hospital inpatient project lies is filled land. The history of filling is generally as follows.

At the hospital's Board Meeting of January 19, 1859, authority was given to the Chairman to execute an indenture to fill the flats between the hospital and the Harbor Commissioner's line. Following this, in April 1859, an Act was passed authorizing the filling of flats and building of a seawall near the MGH. The seawall was not to extend beyond the Harbor Commissioner's line. The filled land included a wharf to the western side of Charles Street (now MDC parkland) as well as parcels to the east of Charles Street (site of project).

It should be noted that although the MGH land is on filled tidelands, the site lies well away from the waterfront. Distances of which vary from 600 to 1,000 feet separate the MGH campus from the Charles River. The MDC playground, Storrow Drive and Charles Street (two multi-lane roadways), all also on filled land, lie between the site and the waters of the Charles River. As shown on Figure 8, these roadways and the park represent a dramatic separation between the hospital and the waterfront. The roadways represent a significant separating force between the site and the waterfront.

Discussion of Chapter 91 Issues Relative to Project
Determination that a project provides a proper public purpose and greater public benefit than detriment in tidelands is the key to Chapter 91 licensing. Elements of such a determination, as outlined in DEQE regulations, include public access to the waterfront, open space on the site, and

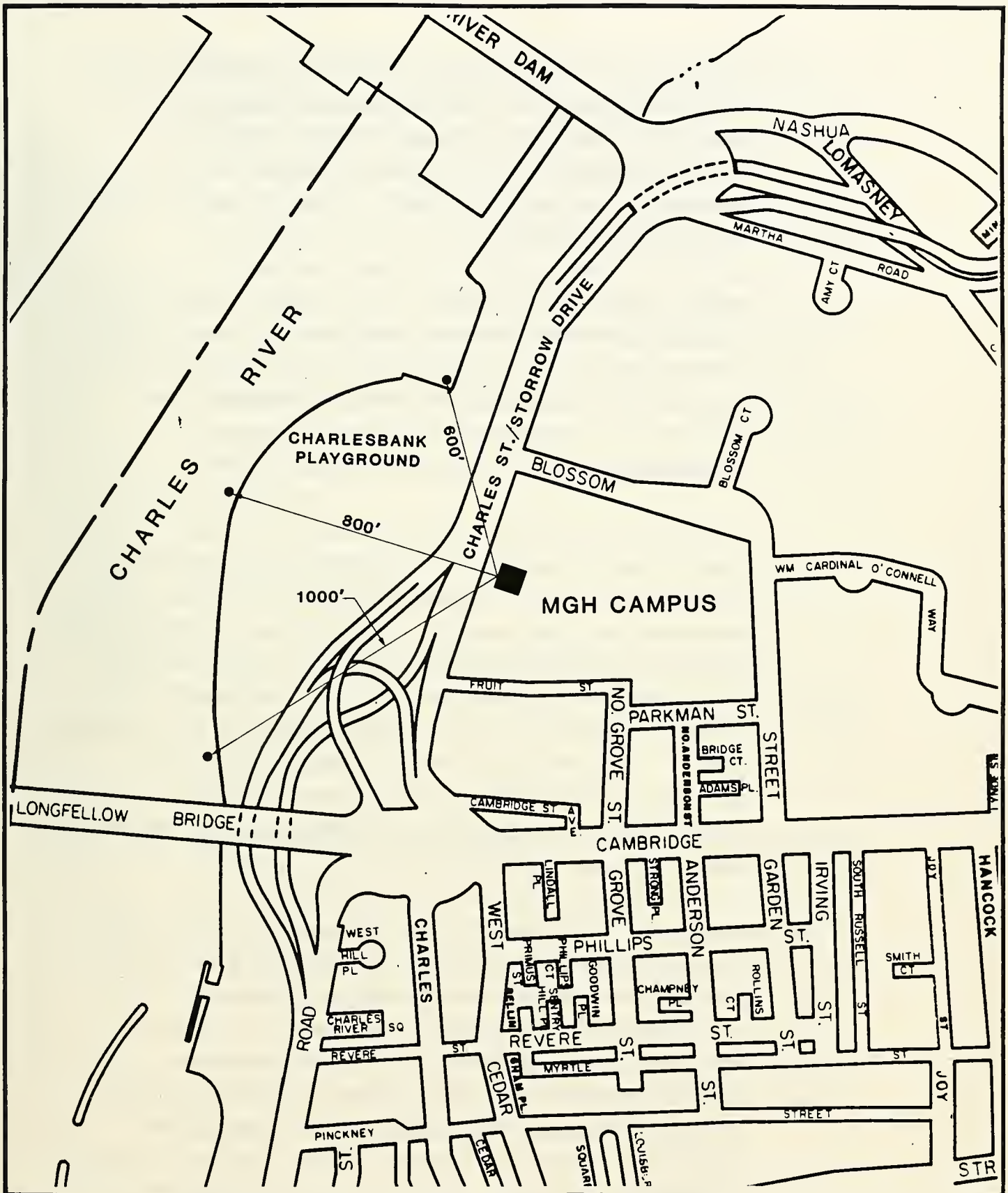


FIGURE 8 DISTANCES BETWEEN THE MGH CAMPUS AND THE CHARLES RIVER

adherence to CZM policies and water dependent use, where applicable. These issues are important for waterfront projects. However, they are less directly relevant for a project located such a distance from the waterfront. Each of these issues is discussed below.

Public Access/Open Space - As a public institution, the Massachusetts General Hospital is open to the general public. Hospital run clinics are open on a drop-in basis while other medical programs are available to patients of all socioeconomic categories through referral and admission.

Open space available on the campus will be significantly expanded, as described in Section 6.6 of the Draft EIR. Outdoor, public open space will increase by 1 1/2 acres. In addition, a significant amount of such open space will lie on the western edge of the site, adjacent to Charles Street, and ultimately closest to the MDC playground and Charles River. Furthermore, the proposed project will introduce additional access points, thereby facilitating penetration into the site and improving public access.

A detailed analysis of the effect the project may have on the MDC playground is presented in Section 3.4 of this FEIR, in response to concerns of the Charles River Watershed Association. In summary, the additional setback of the new structures compared to the existing Phillips House, combined with the stepped roof-line, serve to minimize negative effects on the MDC space. The only direct effect the project will have on the Playground will be shadow. This is presented in detail in Section 6.4 of the Draft EIR. At the Fall/Spring Equinox,

net new shadows will occur in the early morning, swinging away from the area by 10:00 to 11:00 AM. At the summer solstice, when shadows are short, net new shadows barely cross storrow Drive at 9:00 AM, and would not reach the MDC Pool located in the Playground. Net new shadow in the winter (December 22) extend over the Charles River, and add additional shadow to the playground in the morning. All shadows are gone from the playground by noon. From this analysis, it is apparent that project related shadows will not impact the MDC pool during its open season from June 21 through Labor Day. The project will have no affect on public access to the waterfront.

CZM Consistency - The Coastal Zone in the Boston area near the Charles River is bounded by the Central Artery. This is well away from the Hospital campus. For that reason, the CZM consistency criteria related to waterfront Chapter 91 projects, including water dependent uses, are not applicable to this project.

Public Benefit vs. Detriment - The proposed project provides significant public benefit, as described in the Draft EIR. Public benefits include additional open space, improved landscaping, better automobile and pedestrian access, and a significant improvement in overall site aesthetics. In addition to the above benefits, the hospital's ability to continue to provide excellence in medical care is a benefit from this project that is available to the public regardless of socioeconomic status.

3.2.7 CRP Comment: III B - Lack of Information on Air Pollutant Emission Permits

Response: As stated in Section 3.2.4 of this report, the hospital has no intention of using fossil fuel burning equipment to replace or supplement existing underground steam lines. Two or three stand-by generators will be added for emergency power use. Use of these will be infrequent and emission levels will be negligible.

3.2.8 CRP Comment: IV A and B - Consideration of Impacts from the Research Building

Response: The Research Building is described in detail earlier in this FEIR. Furthermore, the DEIR considered all the environmental impacts associated with the Research Building including traffic, views, wind, shadow, open space, pedestrian circulation, historic resources and sewage. Construction impacts were not included because the planning and design of the Research Building are preliminary in nature and therefore have not been included in the original construction schedule.

With regard to the nature of the research to be conducted in the new Research Building, MGH will only conduct research programs of the type already existing on its campus. This includes programs in neuro-biological science, immunology, endocrinology, genetics, and basic studies of laser effects on tissues.

3.2.9 CRP Comment: IV C - Consideration of Traffic Impacts

Response: Since the CRP comments here are based on the Vanasse/Hangen comments on the same subject, the detailed responses are provided in Section 3.3 of this FEIR.

3.2.10 CRP Comment: IV D - Consideration of Wind Impacts

Response: The meteorological data for the period 1965 - 1975 was selected for its consistency in site location and quality. Since December of 1963, the anemometer used to collect Boston wind data has been situated at one location at Logan International Airport (22 feet above ground level). Therefore, the wind data collected between 1965 and 1975 represents a spatially consistent set of wind speeds and wind directions. In contrast, the Boston anemometer location during the period 1945 through 1965 has been changed three times in either location or height. Of the four locations occupied by the Boston anenometer during 1945 through 1965 the first, between 1945 and November of 1951, was atop the Administration building of the Boston Municipal Airport. Since structures under an anemometer can have a significant effect on anemometer performance for considerable heights, the quality of this data was questionable.

The quality of the 1965 to 1975 wind data was examined by comparing probability distributions of both the 1965 - 1974 hourly data and the highest hourly wind speeds recorded at Logan Airport. Highest hourly wind speeds were used for comparison purposes since these occur at the lower frequency levels generally reported as effective gust velocities in wind tunnel studies. The comparison demonstrated a consistent pattern between the two data sets, indicating the validity of utilizing the 1965 through 1975 data for the Mass General wind tunnel study. In addition, ten years of meteorological data is generally considered a long enough period of time to smooth out anomolies and thus sufficiently represent a location's wind climate for pedestrian wind studies.

3.2.11 CRP Comment: IV E - Consideration of Impacts Associated with Increased Sewage Generation

Response: The difference in sewage flow estimates presented in the ENF (150,000 - 180,000 gpd) and the DEIR (200,000 - 261,000) is due principally to the inclusion of the Research Building in the DEIR (137,000 SF at 0.55 gpd/sf = 75,000 gpd). The potential sewage flow from the Research Building was based on floor area and a computed sewage/flow area ratio.

The estimate of sewage flow based on existing water use per SF of buildings is used to conservatively estimate the maximum increase of 261,000 gpd. Use of Massachusetts guidelines (310 CMR 15.02), i.e., number of beds, SF office space, would yield a much lower number. An estimate based on net change in hospital beds are personnel would change in present MGH sewage generation. The most conservative (i.e., highest) estimates are used for the EIR analysis.

Use of water conserving fixtures throughout the new space will reduce water use and thus sewage flow. The effect of these fixtures has not been considered in the conservative flow estimate.

Holding tanks are not necessary for this project. Holding tanks are used to accumulate up to 24 hours of sewage generation for discharge under low tide, non-surcharge conditions. The lines by which MGH sewage reaches Deer Island (West Side Interceptor, Boston Main Interceptor) are not subject to the high tide surcharge conditions experienced in the downtown/financial district areas serviced by the East Side Interceptor (ESI). There is no BWSC policy requiring such holding tanks for the MGH

area. In fact, use of holding tanks in the downtown area will be discontinued upon completion of tide gate repairs and completion of the new ESI.

The MGH site is served by separte storm drains. Furthermore, the project will not result in any increase in storm runoff; the total acreage of building footprint and paved areas will not change significantly as a result of the project.

3.2.12 CRP Comment: IV F - Consideration of Construction Impacts

Response: Since the comments under this section covered several areas, the responses are divided as follows:

- Construction impact of Research Building - See Section 3.2.1 of this FEIR.

- Gas cylinder storage area - See Section 3.2.1 of this FEIR.

- Noise impacts - Although the comment focused only on the hours of operation, the DEIR did in fact recommend several ways to mitigate noise impact. These include the use of pre-augered piles, mufflers and enclosures around work areas, use of welding rather than riveting guns, mixing concrete offsite, employing pre-fabricated structures, electrically powered instead of diesel-powered equipment, hydraulic tools instead of pneumatic impact tools, scheduling of equipment operations to coincide with times of highest ambient noise levels, turning off idling equipment, and keeping noisy equipment

as far as possible from site boundaries. The CRP comment stated that the 7:00 AM to 4:30 PM operating hours are disturbing to "significant numbers of neighboring residents". That time span includes what is considered normal working hours in the construction industry. As a practical matter, it is not likely that the heavy equipment will start up precisely at 7:00 AM. The DEIR did note that the contractor(s) will schedule the noisiest equipment usage to the time of day when the ambient noise is at its highest. Furthermore, the construction does not involve any unusual construction methods that will yield excessive noise levels.

- Construction on filled land - The DEIR did consider the problem of building on filled land and the effects on groundwater. The DEIR stated that the project does not include sub-basements as a measure to avoid affecting groundwater levels. In fact, the existing basements have a greater depth than the proposed new construction.

3.2.13 CRP Comment: IV G - Consideration of the Effects on Views

Response: See page Section 3.2.1 for discussion of the Research Building.

The comment notes that the view from lower level apartments in Charles River Park is not illustrated. The attached supplementary photograph (Figure 9) shows this view. The photograph illustrates the fact that most views from the lower levels of adjacent buildings are already obscured by

FIGURE 9 VIEW OF CHARLES RIVER FROM ROOF OF HAWTHORNE PLACE

existing buildings. Note that the MEEI building to the left, Jackson, Gray/Bigelow on the right and the buildings in between do not allow views of the Charles River. The new inpatient building will be located within this block of buildings.

The CRP comment on the DEIR statement that views of Cambridge are "less significant" quotes the statement out of context. The DEIR states that views of the Charles River, which include the Hatch Shell and Charles River sailing are more significant than the views of Cambridge to the west (emphasis added). It did not preclude Cambridge to the southwest which includes the Harvard Bridge and MIT.

3.2.14 CRP Comment: IV H - Consideration of Aesthetic Impacts

Response: The visual and aesthetic impact of the new construction was reviewed in detail by the BRA staff with the hospital architect during the PDA amendment approval process. These reviews will continue during subsequent phases of design documentation. The comment regarding the height limits established by the BRA is not relevant since this project was approved prior to discussion of the new policy.

With respect to the reference to a "canyon" effect, the set back of the 26-story building does not create such a canyon effect despite the CRP's claim to the contrary. A true "canyon" effect is created by buildings on two sides of a street. Moreover, the effect is perceived by pedestrians and motorists no more than 6 feet above ground level; making the build-to line at least as prominent a factor as the height of the building. Thus, the MEEI building,

Warren and Cox buildings, and the Phillips House do contribute more towards the canyon effect than would the proposed 26-story building. Figures 10 and 11 show that the cut-off angle for light and view for a pedestrian on the sidewalk in front of the Phillips Building remains the same after completion of the 26-story building because of the setback.

The visual and aesthetic effects of the Research Building are discussed earlier.

3.2.15 CRP Comment: IV I - Considerations of Air Quality Impacts

Response: The comment referred to asbestos related and other air quality impacts.

- Asbestos: The DEIR references to the methods of asbestos removal were taken from 310 CMR 7.15. It is intended that all removal of asbestos will be in strict compliance with all state regulations and guidelines. Specifically, removal of asbestos material prior to demolition operation will be performed in a manner consistent with all precautionary measures and procedures required by the Massachusetts DEQE. The procedures outlined in the DEIR will be followed as indicated, in addition to other measures outlined by the DEQE during their pre-demolition inspection.

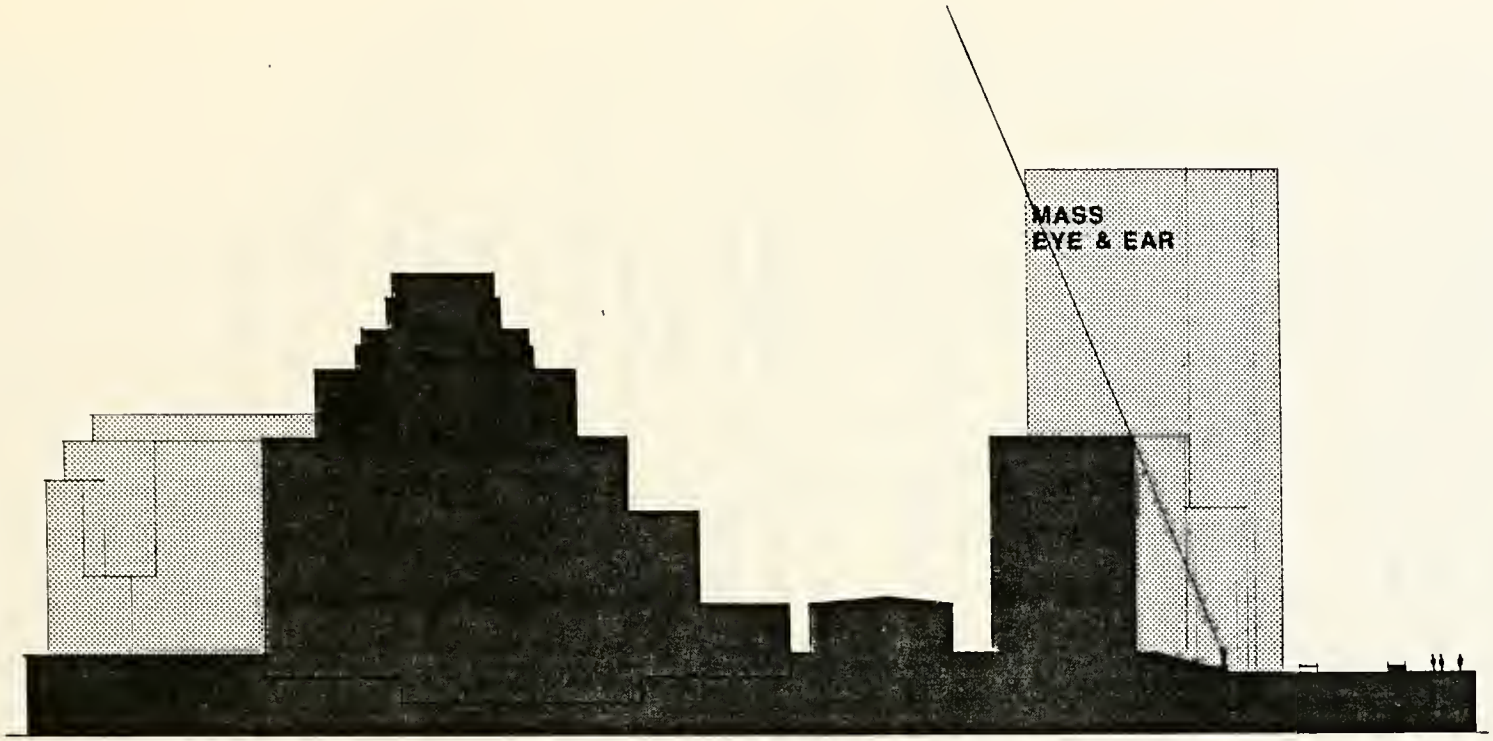


FIGURE 10 **DIAGRAMMATIC SECTION, LOOKING SOUTH**
EXISTING CONDITION

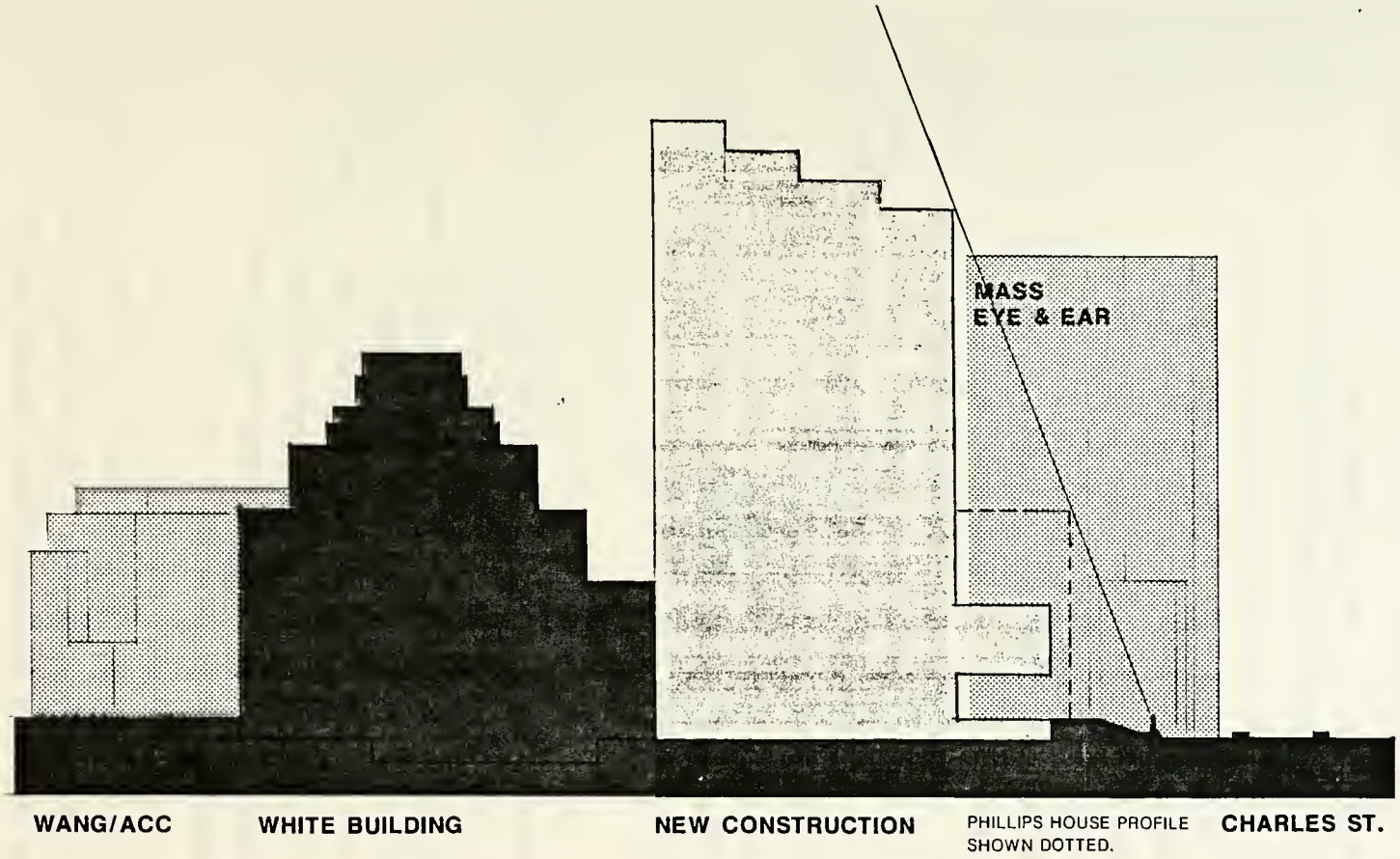


FIGURE 11 **DIAGRAMMATIC SECTION, LOOKING SOUTH**
PROPOSED NEW CONSTRUCTION

The process of sealing-off areas where asbestos materials are being removed involves, first of all, restricting unauthorized access of the work area by positioning caution signs at entrances to work areas and buildings. All potential asbestos emission escape points such as vents, doorways, elevators, stairways, and windows are sealed with duct tape and/or polyethylene sheeting. In addition, all work areas are required to maintain negative pressure to restsrict potential emission of asbestos. The entrance way to the enclosed asbestos removal work area is preceded by a multi-chamber decontamination area constructed of polyethylene. This totally enclosed area allows workers to safely proceed between clean and dirty chambers. Upon completion of asbestos removal areas are monitored for asbestos emission to ensure safe levels prior to departing.

The exact location of on-site storage of double bagged asbestos prior to removal from the project site has not been determined. Potential locations are within work areas or within enclosed dumpsters. Whatever location is selected the storage area will be locked and include the necessary posted warnings to comply with strict Massachusetts laws and regulations.

- Other air quality issues: As stated earlier in this FEIR, the hospital will not replace or supplement its underground steam system with any fossil fuel burning equipment. The DEIR

section on air quality (pages 6-157 to 6-159) adequately addresses the relevent air quality issues and needs no further elaboration.

Ambient air quality levels in the project area are not expected to change significantly, if at all, following completion of the proposed replacement facility. Air quality considerations for projects of this nature are generally influenced by pollutants from motor vehicles. Since project-related traffic activity will remain essentially unchanged, with no significant change in intersection operations, very little change likewise is expected in ambient levels of air pollutants. In addition, the hospital will be purchasing steam and electricity, thus fossil fuel burning will not take place on-site. As for the CRP's comment on traffic, see Section 3.3 of this FEIR for the response to the traffic issue.

3.2.16 CRP Comment: IV J - Considerations of Shadow Impacts

Response: Wind impacts of the proposed Massachusetts General facilities replacement project are not expected to adversely affect project-related shadow impacts. The combination of wind and shadow impacts are generally anticipated to be most noticeable during the colder months of the year when wind chill factors affect pedestrian comfort levels. Examination of Figures 6.4.1 through 6.4.3 for March 21 and Figures 6.4.7 through 6.4.9 for December 22 of the DEIR demonstrate very few pedestrian locations impacted by net new shadows. These figures indicate four potential problem areas when comparing shadow impacts with wind "hot spot"

locations (see Section 6.3 of the DEIR). The first occurs during the mid-morning of both March 21 and December 22 when shadow diagrams indicate new shading near the wind "hot spot" location #19 (see Figure 6.3.5b of the DEIR). Shadow impacts at this location, however, are only anticipated for a period of an hour or so.

In addition, the supplemental wind study which addressed the BRA approved geometry and a number of mitigating measures (see Section 3.5) demonstrated an effective gust velocity of 29 mph at Location 19. This represents a decrease from just above the BRA informal criterion under the immediate construction configuration examined in the DEIR to 2 mph below the BRA 31 mph criterion under the newly approved geometry. Even though this still represents a 4 mph increase above the 25 mph no-build effective gust velocity, it no longer falls into the category of "hot-spot" location. In summary, this addition to new shadows of the proposed facility in Location 19 will result in some lowering of the effective temperature during freezing conditions. However, during the mid-morning spring and fall hours, when net new shadows are anticipated for short periods near wind study Location 19, combined wind and shadow impacts will likely be perceived as small since the project site along Charles Street is already heavily shaded and wind velocities are presently high.

The second location is the Charles River Playground during the mid-morning hours of winter. Figure 6.4.7 of the DEIR demonstrates this area to be predominantly affected by existing shadows. Comparison of no-build and build wind levels

demonstrate the project to have little or no effect on wind levels in this area, including "hot spot" location #6.

The third location is wind study point #4 along Charles Street to the north of the project site. The shadow diagrams indicate new shading of this wind "hot spot" location on December 22 around noontime. The wind study, however, indicates that the proposed project will lower the effective gust velocity at this location from 33 mph (2 mph above the BRA criterion) under the no-build configuration to 30 mph (1 mph under the BRA criterion) with the proposed replacement facility.

The final location is wind study Point #23 which under the proposed configuration is situated beneath the deck above the proposed entrance. At this location the highest wind increase of any "hot spot" location was observed. The effective gust velocity, with construction of the proposed project, increased from 28 mph to 42 mph under the intermediate configuration presented in the DEIR. Results of the supplemental analysis, however, have demonstrated significant wind reduction from the intermediate configuration to BRA approved geometry. Under the BRA approved geometry wind levels decrease to 32 mph, only 1 mph above the BRA informal guidance level. Even without the wind speed increase this location is expected to be somewhat cooler as it will be shaded constantly by the overhead deck. Pedestrians, however, waiting at this entrance will have the opportunity to step indoors if comfort levels diminish during periods of colder temperatures. In addition, the overhead deck provides shelter from other weather elements.

All other noted wind "hot spot" locations are situated within already shaded areas. At "hot spot" location #15 the project results in an overall lowering of the effective gust velocity from 34 mph to 30 mph. This, in general, should provide some additional comfort to pedestrians along Blossom Street during periods of freezing temperature.

At wind study location #16 (See Figure 6.3.5) there is no effective change in wind velocity as a result of the project. Thus, the project provides no benefits nor adverse impacts at this location on the basis of wind and new shadows.

At the wind "hot spot" location #20 the project results in a 3 mph increase of the effective gust velocity determined during wind tunnel testing. Such an increase will result in a slight decrease in equivalent temperatures. It is likely that at these higher wind speeds, wind chill temperatures are low enough so that small wind velocity increases here and the small decreases at study location #15 will not be perceived as significant when accompanied by freezing temperatures.

A complete presentation of shadow impacts on the Charles River Playground and riverfront parkland is provided in the DEIR. A discussion of these impacts is presented below.

During the summer months the only new shadows to these areas are to the extreme eastern edge of the Charles River Playground during the early morning hours (see Figure 6.4.4 of the DEIR). At the spring and fall equinox the shadow lengths are somewhat longer and a slightly larger portion of the Charles

River Playground is impacted by new shadows as a result of the project. The net new shadow, however, only covers a small area of the entire playground and by approximately 10 AM shadows will disappear from this area. During the winter season the playground and waterfront areas already experience significant shading from existing buildings. The proposed project will add some new shadows in the early morning, the bulk of which occur to the Charles River itself. It is anticipated that because of reduced activities in these areas during early morning hours of winter plus the fact that by 11 AM shadows no longer exist at waterfront locations, new shadows will not be perceived as adverse.

It is anticipated that the small amount of new shadows created by the project will have little, if any, adverse effects on the visual appearance of the project and its surroundings. This is especially true when considering the significant amount of shading to the project area which currently exists. In addition, net new shadows do not always occur at the same location throughout the year and when they do impact any one location the period is generally on the order of one hour a day. Finally, the upgrading of the hospital's appearance should significantly enhance the visual appearance of the project site and its surroundings, therefore offsetting any impacts from net new shadows created by the project.

3.2.17 CRP Comment: IV K - Consideration of Open Space Impacts

Response: The CRP comment concentrates on "open spaces that will be eliminated by construction" but ignores the fact that the proposed project will provide a net increase of 68,000 square feet (1 1/2 acres) which is more than 20% of all the land available at MGH. The illustrations shown in Figure 6.6.1 and 6.6.3 of the DEIR and the comparison of the two could not be any clearer as to what areas will become new open space and what areas will be occupied by new buildings. The most significant of these new open spaces will be most prominently visible along Charles Street, where the Phillips House will be removed in favor of the set-backed wrap-around building and along Fruit Street where the Vincent/Burnham and Clinics buildings will be removed to enlarge the court-yard. The overall effect of the new landscaping, walkways and approaches to the new building complex will be far more spacious and inviting than are the present conditions. A clear advantage to the high-rise alternative in this project is the opportunity to open up pedestrian level spaces that will be both attractive and coherent to visitors and employees at the hospital.

On the north side of the hospital, the plan does not change the open space effect on Blossom Street. Blossom Street is presently lined by the complex of existing buildings.

Contrary to the CRP assertion that the DEIR did not have "thoughtful discussion" of open space impacts on surrounding areas, the DEIR provided texts, maps (Figure 6.6.2) and photographs that depict surrounding open space. It was already noted in this FEIR that the visual pattern of high-rises (or canyon effect) had been established by the MEEI

building and the Charles River Park buildings themselves. The set-back of the new complex in place of Phillips House will give a greater sense of openness at the pedestrian level along Charles Street. The new front lawn of the hospital will be landscaped as is noted on page 6-123 of the DEIR. The separation of the campus from the Charlesbank Playground by Charles Street and Storrow Drive and the limited pedestrian access between the two sides is an existing condition; the new construction will have no impact.

The CRP comment in this section also dwells upon density issues and floor area ratio. By considering the issues of density in the section on open space, the CRP comment is confusing in the point that it is trying to make. If the point is that increases in density will have a deleterious effect on open space "both on and off-campus", one need only to look at the facts to see that the opposite is true.

- The increase in floor space for the hospital is needed to meet current operational standards, relieve overcrowding, and increase efficiency, not to increase the uses at the hospital.

- The higher density floor space within the high-rise actually enhances the open space since the hospital can meet its objectives without sprawling out (by acquiring more properties) or occupying remaining open spaces, as a low rise option might do.

- The density issue was settled by the BRA following the approval of the amendment to PDA #15 and the ruling that the project is within

its guidelines for development.

3.2.18 CRP Comment: IV L - Consideration of Impacts on Historic Resources

Response: Contrary to the CRP's assertion, the DEIR considered historical resources both within and outside the MGH campus at great length. The comments completely ignore the already dense development of high rise buildings, including Charles River Park, which obstruct the views of historic buildings from many vantage points. If the major amenity being offered by Charles River Park and Hawthorne Place condominiums is the view of the Bulfinch Building and the Ether Dome, the new construction will not in any way alter one's ability to view or not view the landmark.

The CRP comment also distorts and takes out of context the DEIR statements on page 6-138 when it implies that the DEIR claims "that no evaluation or even identification of impairment to historic sites is necessary because the single vantage point, which it considers as the 'best' spot for viewing the Bullfinch Building, is not obstructed." No such claim is made. Rather the DEIR simply notes the fact that the present conditions within the courtyard in front of the Bullfinch Building is the best view (maybe the only real view remaining at street level to appreciate the architectural details of the building); that this view will not be altered by the proposed new construction; and that given the first two facts, the "visual and aesthetic character..... will be maintained".

3.2.19 CRP Comment: IV M - Consideration of Cumulative Impacts in Conjunction with Other Projects

Response: The DEIR does in fact consider the cumulative impacts of all known projects in the area that will be completed by 1995. The Charles Street Jail is not considered at great length because as of this writing its future use is not determined. It would be highly spculative to base any conclusions on anything other than known projects and conditions. In any case, the DEIR does consider "worst-case" scenarios.

3.3 Charles River Park and Hawthorne Place Condominiums

Comments by its engineers Vanasse/Hangen on traffic impacts.

The letter dated December 26, 1985 by Vanasse/Hangen presents a qualitative review of the transportation impact analysis contained in the DEIR. This response, therefore, is also limited to a qualitative basis, with the necessary quantitative support material already published in the draft document.

The traffic impact study area addressed in the Draft EIR is in compliance with the MEPA Scope for this project, and consistent with the limited scale of transportation impacts the project will produce. In particular, given the small traffic volumes expected from the project, and the minute impact these trips have on intersection operations within the study area, it is strongly felt that the extent of the study area is appropriate. Project related trips using Leverett Circle, for example, represent such a tiny fraction of vehicles using that intersection that no measurable impact would be expected. Table 6.1.4 (Modal Use) of the Draft EIR indicates that the proposed Research Center will generate a total of only 160 person trips, on a daily basis. Approximately 128 of these trips will be either by private vehicle or public transportation (i.e., there will be 64 trips using each mode). It should be reiterated that these trip generation rates assume a vehicle occupancy of 1.0 persons per vehicle. These trip totals, therefore, do not account for likely ridesharing/carpooling activities and consequently yield a conservative (i.e., worst-case) estimate of project-related vehicles.

It is evident that traffic flow dynamics at several upstream and downstream locations from the Cambridge Street access to the site heavily influence operations at the Cambridge Street/North Grove Street and Cambridge Street/Blossom intersections. In addition, as mentioned in the DEIR, traffic operations at Leverett Circle also influences

vehicular circulation in and around the Hospital campus. The limited number of additional vehicle trips associated with the proposed project, however, will not significantly impact traffic operations at these "external" locations. A discussion of these "external" influences and the Hospital's commitment to working within these constraints is presented in Section 3.5 of this FEIR.

The Draft EIR presents a parking analysis consistent with the MEPA Scope for the project. This analysis includes an outline of recently implemented, ongoing and proposed programs by MGH that will result in a reduction in vehicle trips to the site and subsequent reduction in parking demand. These programs have the potential to more than offset the limited increase in traffic expected to be generated by the Research Center. A list of the programs currently in place is as follows:

- Preferred parking for high occupancy vehicles (HOVs);
- MBTA pass program;
- Increased parking fees at MGH-owned parking facilities (i.e., including the Parkman Street and Fruit Street garages) to be more compatible with current City-wide rates; and
- Subsidization of short and long-term parking for visitors and patients.

The latter two programs became effective on September 1, 1985 and were the result of regular monitoring of on-site parking trends. The hospital will continue to review internal vehicle circulation and parking patterns in the future. These evaluations will occur on a regular basis and be utilized as the primary criteria in developing updated parking management strategies.

3.4 Charles River Watershed Association - comment by Cassie Thomas dated December 13, 1985.

Response: The CRWA comments raised two points. The first relates to the question of aesthetics, particularly in terms of views from the Charlesbank Playground. The second relates to the broad issue of parking; the future of open lot parking near MGH and the collective effort of the "several construction projects planned for the West End in the next few years".

3.4.1 Aesthetics - In response to the CRP comment IV H in Section 3.2.14, this FEIR has partially responded to the CRWA comment. In addition, Figures 12 and 13 illustrate before/after views from the Charlesbank Playground. As noted earlier, the 26-story building's set back and its blending into already established patterns of similarly sized buildings from the Charles River Park project to the MEEI, the effect from the Charlesbank Playground at pedestrian level will not be one of unwarranted visual intrusion nor will it discourage users of the park to continue to enjoy it in its present state.

3.4.2 Parking - the ENF certificate required that "special attention should be paid to inventory of parking at and near the MGH campus, to strategies to improve use of available parking, and to demand management techniques to reduce both traffic and parking effect." The DEIR addressed these issues in Section 6.2, which includes existing conditions of and a summary of parking management strategies. The CRWA comment raises several issues that are beyond the scope of this EIR and the MGH Facilities Replacemene project. These are as follows:

FIGURE 12 VIEW OF MASSACHUSETTS GENERAL HOSPITAL AND MASSACHUSETTS EYE AND EAR INFIRMARY FROM THE CHARLESBANK PLAYGROUND - EXISTING CONDITION

FIGURE 13 VIEW OF MASSACHUSETTS GENERAL HOSPITAL AND MASSACHUSETTS EYE AND EAR INFIRMARY FROM THE CHARLESBANK PLAYGROUND - PROPOSED NEW CONSTRUCTION

- The open parking lots being referred to are located at 220 Charles Street within several on and off ramps at Storrow Drive. These lots are leased to and are controlled by the Massachusetts Eye and Ear Infirmary and not by the Massachusetts General Hospital.

- Discussions on the land swap between the Nashua Street/Charles Street Jail are not concluded and therefore it is not possible to assess potential parking implications of such a move.

- Any impacts resulting from the Central Artery reconstruction would have to be studied separately as part of an assessment of that project.

3.5 Metropolitan Area Planning Council (MAPC)

Response: The MAPC comments included several components which were prepared by its staff, MAPC representative Richard Dimino and the BRA. The responses are as follows:

3.5.1 Mr. Dimino/staff comment on construction traffic impact - Both the Metropolitan Area Planning Council (MAPC) and Mr. Dimino requested a commitment from MGH to provide traffic control that will prevent on-site construction vehicles from impacting study area traffic flows. With regard to this request, the hospital is prepared to work with the Boston Police Department and Bureau of Traffic and Parking to ensure that proper traffic management is performed for the duration of the proposed project. Specific strategies for vehicles and pedestrian control in the vicinity of critical construction areas will be developed by MGH and presented to the Bureau of Traffic and Parking prior to construction.

A preliminary evaluation of planned construction activity indicates that the positioning of two traffic control officers on either side of the construction activity (i.e., one downstream and one upstream) supplemented with advance warning signs and/or beacons will mitigate any potential construction-related impacts. The hospital will continue to work directly with the Boston Police Department and Bureau of Traffic and Parking throughout construction in order to evaluate the effectiveness of "in-place" management plans. This evaluation will afford an opportunity to adjust traffic control strategies to reflect unforeseen contingencies in the construction process. This coordinated planning effort will ensure the maximum amount of safety to vehicles and pedestrians in the study area.

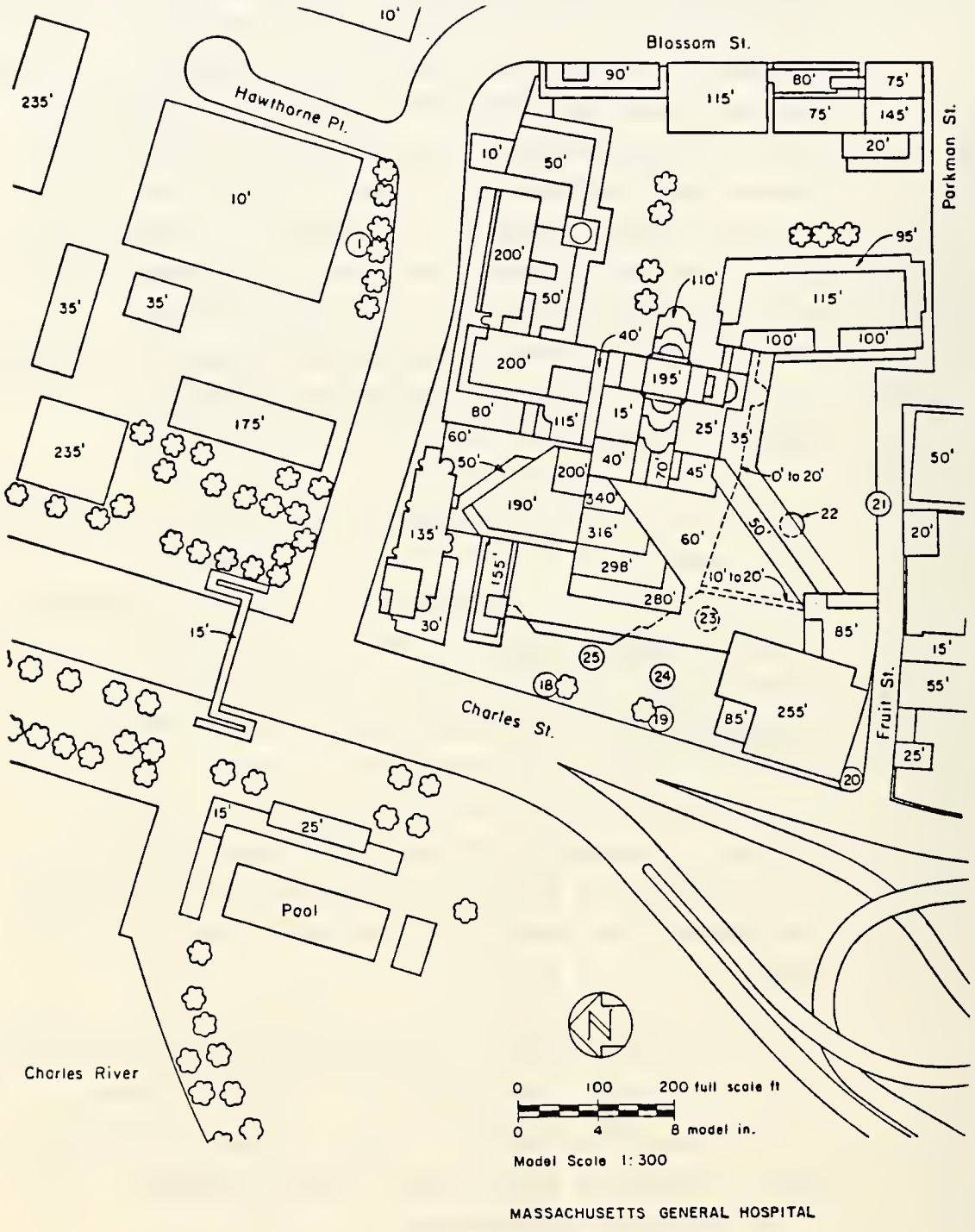


FIGURE 14 BUILDING LOCATION AND PEDESTRIAN WIND VELOCITY MEASURING POSITIONS FOR CONFIGURATION G

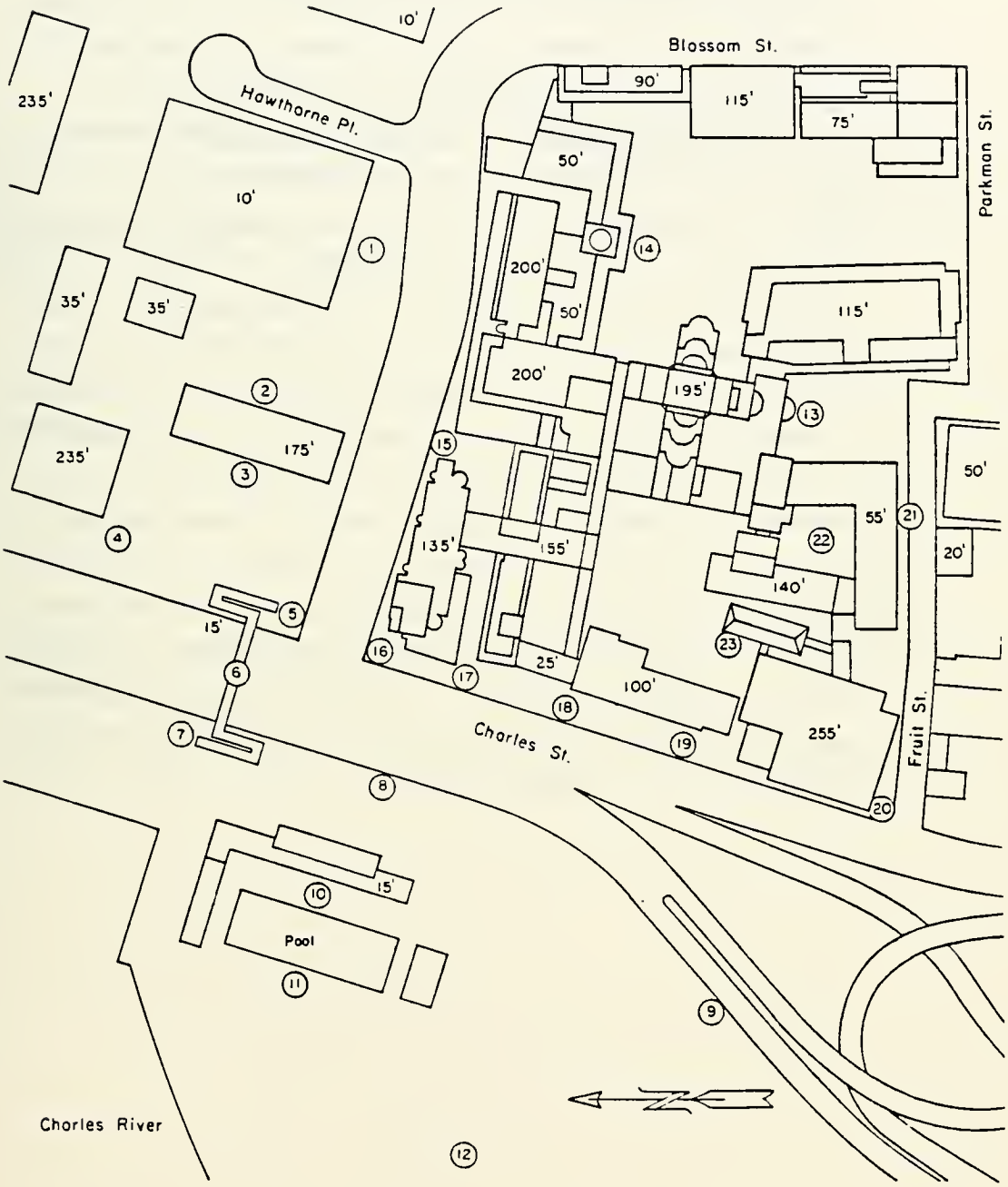


FIGURE 15 BUILDING LOCATION AND PEDESTRIAN WIND VELOCITY MEASURING POSITIONS FOR CONFIGURATION F

Test Results - To enable a quantitative assessment of the project's wind environment, wind-tunnel data were combined with wind frequency and direction information obtained at Logan International Airport as described in the original report. These data were converted to velocities at the reference velocity height for the wind-tunnel measurements (900 ft) and combined with the wind-tunnel data to obtain cumulative probability distributions (percent time a given velocity is exceeded) for wind velocity at each measuring location. The percentage times were summed by wind direction to obtain a percent time exceeded at each measuring position independent of wind direction (but accounting for the fact that the wind blows from different directions with varying frequency). Results of the supplemental wind analysis are presented in Table 2. These wind data are presented as effective gust velocities* exceeded 1% of the time and are compared to the BRA wind criterion of 31 mph. The test points studied cover the approximate area that highest winds were observed at the project site.

* Effective gust velocity is defined as the mean velocity plus 1.5 RMS.

TABLE 1

EFFECTIVE GUST VELOCITIES (MPH)

EXCEEDED ONE PERCENT OF THE TIME

LOCATION	Configuration F Preconstruction	Configuration G BRA Approved Geometry	BRA Criterion
18	29	22	31
19	25	29	31
20	40	43	31
21	25	34	31
22	18	21	31
23	28	32	31
24	*	30	31
25	*	19	31
Average	27.5	29.8	

3.5.4 BRA comment on parking - Although it was noted in the DEIR that the Facilities Replacement project would not substantially increase the demand for parking, the hospital is committed to devising new policies to maximize the use of spaces, particularly for visitors and other short term users.

These policies are cited in the DEIR on pages 6-64 and 6-65. In response to specific recommendations by the BRA, the following should be noted:

MGH Visitor Parking Policy - The BRA notes that the existing Parkman Street and Fruit Street garages are frequently over-saturated, as evidenced by the number of "no-stays" during the midday period. Also, the level of employee parking within the garages does not allow for sufficient visitor and patient service. The Hospital has recently updated its parking management plan to improve this situation. This plan, which became effective on September 1, 1985, consists of the following new elements:

- Subsidization of short and long-term parking for visitors and patients at the Parkman Street and Fruit Street garages; and

- Increased parking fees for other users (e.g., employees) of these garages as well as all other MGH-owned facilities.

These strategies were implemented to discourage long-term use of garage space by MGH employees and other commuters to the area, thus creating additional visitor parking space. A summary of the parking rate changes at the MGH-owned facilities is as follows:

Locations	Old Rates	Rates Effective 9/1/85	
Fruit Street Garage	$50.00	$80.00	
Parkman Street Garage	$50.00	$80.00	
Holiday Inn	$50.00	$80.00	
Lomasney	$50.00	$65.00	
Nashua Street	$22.00	$40.00	
Beacon Hill	$22.00	$40.00	
Evening	$22.00	$40.00	
GSA Lot	$20.00	$25.00	(Effective 1/1/86)

The Hospital is committed to another rate increase in 1986 which will at least match the 1985 level of increase. Parking rates at these facilities will be regularly reviewed in future years and, if necessary, increased to match City-wide market levels.

The visitor/patient subsidization program provides these user groups with a booklet containing discount parking coupons that are valid in the Fruit Street and Parkman Street garages. The price of one booklet is $15.00. One booklet contains five coupons, each of which are valid for three to twelve hours of parking. This program presents the potential of significant savings to frequent long-term visitors and patients of MGH.

The hospital will explore the feasibility of holding a specific number of on-site parking spaces for exclusive use by visitors and patients. Correspondence detailing the parking rate increases and patient/visitor discounted parking plan are contained in Appendix 4 of the Draft EIR.

MBTA Pass Program -- Approximately 957 members of the hospital staff participated in the hospital's MBTA pass program during the 1985 fiscal year. This figure represents an increase of 45% in program utilization when compared to the previous fiscal year.*

Passes are available for use on all of the MBTA's train and bus lines. The cost of the pass is accounted for as a payroll deduction from participating staff members. Passes are distributed through the payroll office to specific departments at the hospital. This serves as an incentive to participation by eliminating the amount of time and effort that would otherwise be required in obtaining the pass. The hospital does not subsidize the "out-of-pocket" costs to program participants.

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* Source: Massachusetts General Hospital payroll office, April 1986.

3.6 Boston Water and Sewer Commission

Response:

BWSC/MWRA Collection and Treatment System - Overview

Sanitary waste discharged into the city's sewer system flows through mainly combined sanitary and storm drainage sewers operated by the Boston Water and Sewer Commission. However, in the MGH area, separate sanitary and storm sewers are available on Charles, Blossom, Fruit and North Grove Streets. The sanitary and storm sewers which serve the Mass General complex discharge to a sanitary interceptor and a large storm drain beneath Charles Street. The storm drain eventually discharges to the Charles River. The sanitary flow enters the BWSC's West Side Intecepter. As shown on Figure 16, the West Side Interceptor enters the head end of the Boston Main Interceptor.

- Boston Main Interceptor

  The Boston Main Interceptor (BMI) generally flows from west to east through the southern part of Boston. The BMI serves to convey flows from several Boston interceptors to the junction with the MWRA system in the Columbia Point area. Interceptors discharging into the BMI include the Stony Brook Interceptor, the Roxbury Canal Sewer, the East Side Interceptor, the Dorchester Brook Sewer, the Dorchester Interceptor, and the South Boston Interceptor, as well as the West Side Interceptor. The BMI's route is shown on Figure 16. It runs easterly along Camden Street to Washington Street, and on to Massachusetts Avenue where it continues east to a junction chamber near Kosciuszko Circle. Average dry weather flows in the BMI are estimated to be about 44 MGD. Peak flow capacity is in excess of 120 MGD.

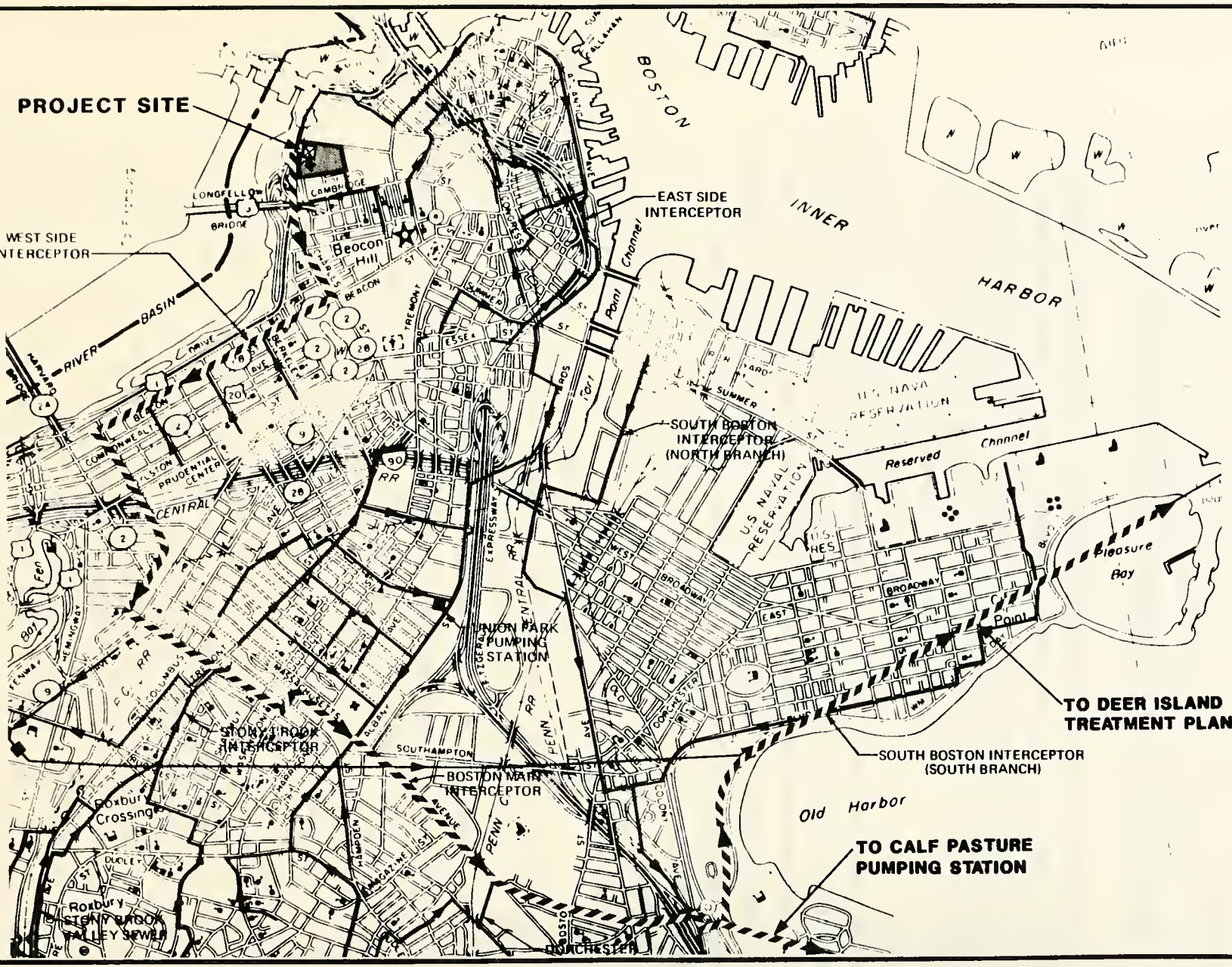

FIGURE 16 BOSTON MAIN INTERCEPTOR

The BMI conveys flows from Boston's various interceptors to a junction chamber located near Kosciuszko Circle (see Figure 16). At this chamber, flow is directed north along the MWRA Columbus Park Connector (116" x 87" pipeline) to the MWRA Interceptor and on to the Deer Island Treatment Plant. The Columbus Park Connector can convey a peak flow of 180 MGD. Average flow in the connector is approximately 66 MGD. When flows exceeding the capacity of the Columbus Park Connector reach the junction chamber near Kosciuszko Circle, they are directed east along the BMI extension to the Calf Pasture Pumping Station and then on to the Moon Island outfall (see Figure 16).

- MWRA Tunnel to Deer Island

Wastewater collected in the Boston Water and Sewer Commission's system enters the MWRA system at the Columbus Park Headworks. The headworks can accept sewage from the Boston Main Interceptor (via the Columbus Park Connector) at a rate of 180 MGD. This would be the peak flow during storm events. Average dry weather flow to the headworks is 66 MGD. The MWRA Interceptor conveys sewage from the Columbus Park Headworks to the Deer Island Treatment Plant The MWRA interceptor is a 138" round pipeline with a peak capacity of 440 MGD, which is attained during storm events.

The Deer Island Treatment Plant has a peak hydraulic capacity of 870 MGD. Average flow through the plant is 343 MGD. Using relief outfalls, total discharge capacity is 924 MGD. The treatment plant provides primary treatment and chlorination prior to discharging the wastewater.

The operating strategy at Deer Island during high flows requires throttling back flows into the Columbus Park Headworks. This results in flow reversal in the BMI and increased flows at the Ward Street Headworks (Huntington Avenue - Longwood Avenue area) via the Boston Main Drainage Relief Sewer. If the total flow continues to increase beyond the Ward Street Headworks capacity, excess flow backs up to combined sewer overflow (CSO) treatment facilities at the Charles River Basin. In the event that the total flow exceeds both the capacity of Deer Island and the satellite CSO facilities, the Calf Pasture Pump Station is activated to pump overflows to the Moon Island outfall.

- Calf Pasture Pumping Station to Moon Island

When flows exceed available capacity in the Columbus Park Headworks, wastewater continues along the Boston Main Interceptor on Mt. Vernon Street to the Calf Pasture Pumping Station and then on to Moon Island via the Dorchester Bay Tunnel. The Moon Island outlet facility serves as a wet weather and partial dry weather bypass for the MWRA's Deer Island Treatment Plant. The facility can store about 50 MGD for release when tides are receding in the Harbor. Currently, overflows at Moon Island occur at a rate of 40 to 60 days per year. In 1981 and 1982 when pumping problems existed at Deer Island, there were 227 discharges from Moon Island. When upgrading of the MWRA's Deer Island Treatment Plant is completed, it is expected that there will be about 12 discharges per year at Moon Island.

Historically, these discharges have been on the order of 5 to 16 million gallons each occurrence. After upgrading, discharges are expected to be less than 12 million gallons each occurrence.

- Plans for System Improvements - East Side and Boston Main Interceptor Replacement

Water quality problems in the Inner Harbor can be significantly reduced if dry weather overflows are eliminated and if wet weather combined sewer overflows are properly controlled. Currently, the MWRA and the Boston Water and Sewer Commission are implementing elements of a Recommended Plan for Combined Sewer Overflow (CSO) control. The plan is intended to eliminate dry weather overflow by in-system modifications to tidal gates and regulators, by improvements in collection capacity (e.g., new East Side Interceptor) and by continuing inspection and maintenance programs. The plan also calls for reductions of up to 75% in the frequency and volume of CSO. The goal is to limit untreated discharges to once per year per outfall.

In conjunction with this plan, the Boston Water and Sewer Commission has initiated a $60 million design and construction program to replace major sewer interceptor pipes. The program is designed to eliminate dry weather overflows caused by insufficient capacity in the existing systems and to provide replacements where the system has deteriorated.

As part of this program the portion of the New Boston Main Interceptor which runs from Andrew Square to the MDC Columbus Park Headworks was completed in 1984. This 102" pipeline is 2650 feet long and has a capacity of 166 MGD. The existing BMI's equivalent capacity is 123 MGD.

- Plans for System Improvements at Deer Island Treatment Plant

  The MWRA is currently in the process of upgrading the Deer Island Treatment Plant in two stages. The first stage is an immediate upgrade to improve pumping capacities at the plant. This program is intended to prevent situations where failure of pumping equipment at Deer Island leads to increased discharges at CSO facilities and the Moon Island outfall. This stage is intended to be complete by 1988.

  The second stage is construction of a new facility to increase treatment capacity and provide secondary treatment capability. A design contract for the treatment plant upgrade was recently awarded by MWRA. Parallel efforts are underway to site and design the required sludge management facilities. This program will extend into the mid 1990's.

MGH - Existing Sewage Flows

The existing sewage flow generation at the hospital has been estimated based on usage data for all water meters located on campus for the one-year period between July 1983 to July 1984. With the exception of cooling system evaporative losses water use and sanitary sewage flow are closely linked. On the basis of measured water use, it is estimated that the hospital generates sanitary sewage at a rate approximately 1.1 million gallons per day (MGD).

FIGURE 17 SANITARY AND STORM SEWERS AT THE MASSACHUSETTS GENERAL HOSPITAL

MGH - Existing Site Sewer System

The MGH campus is serviced by a well developed network of sanitary and storm sewers. For the most part, separate sanitary and storm lines are in place although a few older combined lines remain in use. Figure 17 illustrates the existing system in the project site area. Lines serving MGH connect to the BWSC lines at several locations along Charles and Blossom Streets.

Future Sewage Flows

Sewage generation after completion of the project was conservatively estimated on the basis of existing MGH water use (gpd/SF) and project square footage. To estimate sewage volumes based on floor area only, the 1984 metered water use (1.1 MGD) and the total square footage of buildings in service (1.8 million SF), were used to calculate an average sewage flow of about 0.55 gallons per day per square foot.

Although the total amount of new construction totals about 840,000 square feet, 365,000 square feet will be replacement of demolished areas; therefore the net increase in floor area totals about 475,000 square feet. A detailed listing of all the buildings to be demolished and built over the eight-year construction period is presented in Table 2, including the estimated sewage flow generated by each of the buildings. The figures on Table 2 are listed in order of occurrence over the project's eight-year construction period. Based on this table, a maximum increase of 261,000 gallons per day (GPD) would be expected based on the increased square footage.

While this conservative estimate was used for project analysis purposes, it should be recognized that the actual increase in sewage flow attributable to the project could be much less than 261,000 GPD. The total number of beds at MGH will not increase as a result of this project. Total staff may eventually decrease due to the more efficient space and

TABLE 2

ESTIMATED MAXIMUM SEWAGE VOLUME CHANGES DURING CONSTRUCTION OF REPLACEMENT FACILITIES AND RESEARCH BUILDING[1]

EXISTING CONDITIONS

BUILDINGS	SQUARE FOOTAGE	SEWAGE FLOW
MGH Complex GPD[2]	1,949,400 SF	1,062,300

PROPOSED EIGHT YEAR BUILDING PROGRAM [3]

BUILDINGS [4]	SQUARE FOOTAGE	SEWAGE FLOW
Phase 1		
Temp I	(19,478)	(10,713 GPD)
White West	(2,893)	(1,591 GPD)
Building One	341,074	187,591 GPD
Research Lab	39,000	21,450 GPD
Phase 2		
Baker	(151,722)	(83,447 GPD)
Buiding Two	292,198	160,709 GPD
Research Lab	56,000	30,800 GPD
Phase 3		
Phillips	(98,995)	(54,447 GPD)
Rehabilitation	(8,760)	(4,818 GPD)
Vincent/Burnham	(82,997)	(45,648 GPD)
Wrap-Around	70,000	38,500 GPD
Research Lab	42,000	23,100 GPD
Building Program Net Change	+ 475 427 SF	+ 261 486 GPD
MGH Complex Totals @ Completion of Building Program	2,424,827	1,323,786 GPD

TABLE 2 (continued)

ESTIMATED MAXIMUM SEWAGE VOLUME CHANGES DURING CONSTRUCTION OF REPLACEMENT FACILITIES AND RESEARCH BUILDING(1)

(1) Based on data received from Thompson Consultants, Inc., Project Engineers

(2) Existing conditions based on 1984 water meter readings and 1984 square footage adjusted to reflect construction completed since 1984.

(3) Numbers in brackets reflect demolition of existing structures

(4) Maximum sewage flows estimated using factor (0.55 GPD/SF) derived from 1984 water meter data.

facilities. In addition, water conserving fixtures (lavatories, sinks, showers, toilets, urinals) will be used throughout the new buildings. This will significantly reduce water use and will limit the extent of any increased sewage flow.

Storm drainage from the MGH will not change as a result of the project. Total area of building footprints and paved areas will remain essentially unchanged.

Proposed Sewer Connections

Figure 18 shows the proposed new sanitary and storm sewers to be installed as part of the project. Phase I of the project includes construction of the 26 story medical building. A new 12" sanitary sewer and a new 8' storm drain will service the new tower as well as parts of two existing MGH buildings. These lines will also service the Phase III wraparound building.

The 12" sanitary sewer will enter the large (3'0" x 4"6") interceptor sewer under Charles Street at a point approximately 250" north of the intersection of Charles and Fruit. The interceptor sewer conveys sanitary sewage south along Charles Street to the BWSC West Side Interceptor.

The 8" storm drain will connect to the existing combined sewer under Charles Street. This very large sewer (7'8" x 6'4") is understood to convey only storm drainage, the direction of flow is south along Charles Street. Storm water discharge is to the Charles River.

Sanitary and storm drainage from the Research Building will be routed to existing separate sanitary and storm sewers on the MGH site. No new connections to the BWSC system will be required for the Research Building. The existing lines to be used by the Research Building connect with the BWSC system on Fruit Street and then discharge to the sanitary and storm water interceptors at the corner of Charles and Fruit Street.

Phase II of the project includes the demolition of existing space and the construction of the 16 story building. Completion of the wraparound building and the balance of the

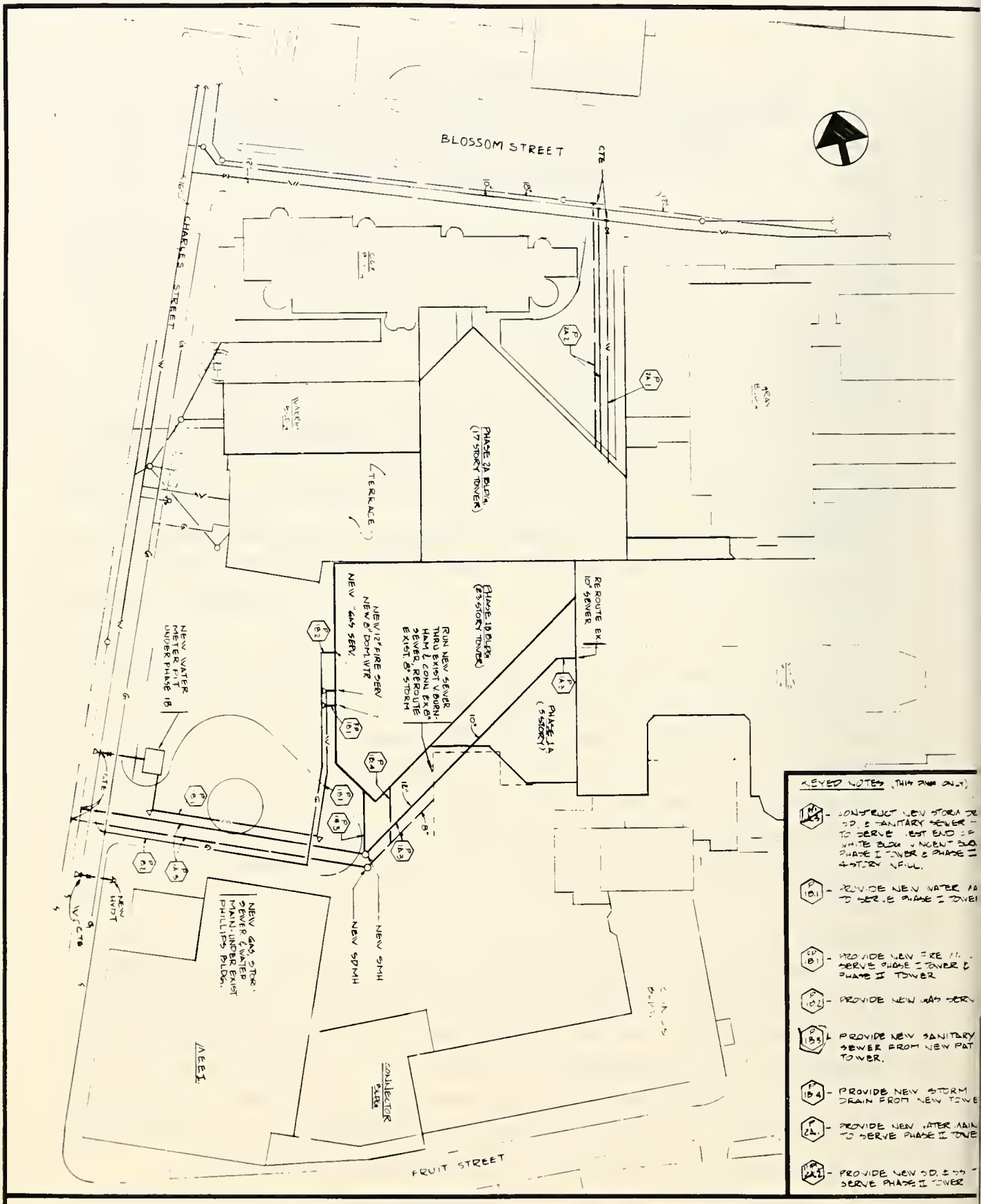
BLOSSOM STREET
CHARLES STREET
PHASE 2A BLDG. (17 STORY TOWER)
TERRACE
PHASE 1B BLDG. (23 STORY TOWER)
PHASE 1A (5 STORY)
REROUTE EX. 10" SEWER
NEW 12" FIRE SERV
NEW 8" DOM. WTR
NEW "GAS SERV.
RUN NEW SEWER THRU EXIST V. BURN-HAM & CONN EXIST SEWER, REROUTE EXIST 8" STORM
NEW WATER METER PIT UNDER PHASE 1B
NEW GAS, STORM SEWER & WATER MAIN UNDER EXIST PHILLIPS BLDG.
NEW SDMH
NEW SMH
NEW HYDT
CONNECTOR BLDG.
FRUIT STREET
KEYED NOTES (THIS PAGE ONLY)
- CONSTRUCT NEW STORM DR. & SANITARY SEWER TO SERVE EAST END OF WHITE BLDG. UNDER BLDG. PHASE I TOWER & PHASE II 4 STORY INFILL.
- PROVIDE NEW WATER MA TO SERVE PHASE I TOWE
- PROVIDE NEW FIRE SERVE PHASE I TOWER & PHASE II TOWER
- PROVIDE NEW GAS SERV
- PROVIDE NEW SANITARY SEWER FROM NEW PAT TOWER.
- PROVIDE NEW STORM DRAIN FROM NEW TOWE
- PROVIDE NEW WATER MAIN TO SERVE PHASE II TOWE
- PROVIDE NEW S.D. & SA SERVE PHASE I TOWER

FIGURE 18 PROPOSED NEW SEWER LINES

demolition will occur during Phase II. New separate sanitary and storm lines will be constructed to service the 16 story building. The sanitary line will connect with an existing 10" sanitary sewer under Blossom Street. This line runs to the west and empties into the Charles Street sanitary interceptor. The storm drain line will be connected to a 12" storm drain under Blossom Street. This line is stepped up to 18" just to the west of the proposed connection and flows west to Charles Street. At the intersecton of Blossom and Charles, the 18" storm line empties into the large storm sewer which runs south along Charles Street.

Initial discussions between the BWSC and project engineers indicate the existing sanitary and storm sewers in the MGH area are adequate to accommodate potential increases in sanitary sewage flow. As previously noted, storm water discharges will not increase as a result of this project.

With respect to the potential increased sanitary sewage flow, the project phasing coupled with ongoing BWSC and MWRA system improvements should preclude any significant impacts. As previously noted, water conserving fixtures are incorporated throughout the project design. These include: 5 gpm lavatories, 1 1/2 - 2 gpm sinks, 3 gpm showers, and 2 1/2 - 3 gallon toilets (as required by code). Details of the proposed sewer connections will be subject to the BWSC and Massachusetts DPWC approvals.

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